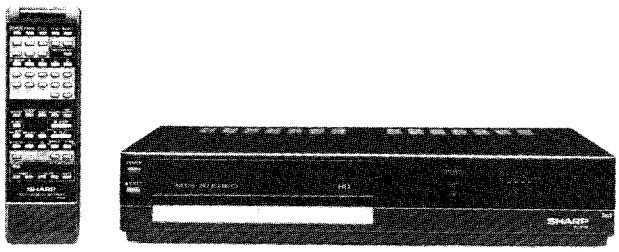
SHARP SERVICE MANUAL

SX8N2VC-M705U



VHS VIDEO CASSETTE RECORDER

MODEL VC-M705U

In the interests of user-safety (Required by safety regulations in some countries) the set should be restored to its original condition and only parts identical to those specified should be used.

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SHARP ELECTRONICS CORPORATION

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National Parts Centers: Sharp Plaza, Mahwah, New Jersey 07430-2135 Phone (201) 529-9100

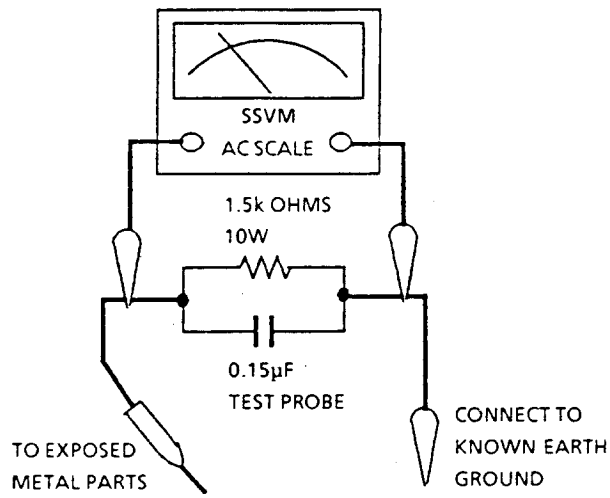
IMPORTANT SERVICE NOTES

BEFORE RETURNING THE VIDEO CASSETTE RECORDER

Before returning the video cassette recorder to the user, perform the following safety checks.

1. Inspect all lead dress to make certain that leads are not pinched or that hardware is not lodged between the chassis and other metal parts in the video cassette recorder.
2. Inspect all protective devices such as non-metallic control knobs, insulating materials, cabinet backs, adjustment and compartment covers or shields, isolation resistor/capacitor networks, mechanical insulators etc.
3. To be sure that no shock hazard exists, check for current in the following manner.

- Plug the AC line cord directly into a 120 volt AC outlet (Do not use an isolation transformer for this test).
- Usintg two clip leads, connect a 1.5k ohm, 10watt resistor paralleled by a 0.15µF capacitor in series with all exposed metal cabinet parts and a known earth ground, such as a water pipe or conduit.
- Use an SSVM or VOM with 1000 ohm per volt., or higher, sensitivity or measure the AC voltage drop across the resistor (See Diagram).
- Move the resistor connection to earth exposed metal part having a return path to the chassis (antenna, metal cabinet, screw heads, knobs and control shafts, etc.) and measure the AC voltage drop across the resistor, Reverse the AC plug on the set and repeat AC voltage measurements for each exposed part. Any reading of 0.45V rms (this corresponds to 0.3mA rms AC.) or more is excessive and indicates a potential shock hazard which must be corrected before returning the video cassette recorder to the owner.



WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO WET LOCATIONS.

CAUTION

RISK OF ELECTRIC SHOCK
DO NOT OPEN

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER. NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

This symbol warns the user of uninsulated voltage within the unit that can cause dangerous electric shocks.

This symbol alerts the user that there are important operating and maintenance instructions in the literature accompanying this unit.

CAUTION

1.6A 125V

This symbol mark means following. For continued protection against fire hazard replace only with same type fuse F901 (1.6A, 125V).

FEATURES

1. 8 Hours Recording / Playback Capability with T-160 Tape. (SP/LP/EP Mode Rec. Switchable)
2. Automatic Cassette Front Loading mechanism.
3. Microcomputer Controlled Power Assist Driving (P.A.D) Mechanism with Direct Access Soft Touch Operation of the VCR Primary Functions.
4. H.Q. System for Better Resolution and Color Reproduction.
5. Double Comb Filter for Crisper, Cleaner Pictures.
6. Frequency Synthesizer Tuning System Capable to Receive 169ch. including CATV.
7. Built-in 1-year, 8-Event or Daily and Weekly Programmable Timer 12-Hours AM/PM Indication Fluorescent Display Clock.
8. 58 - Function Wireless Remote Control
9. On-Screen Display for Setting/Checking Programing and Checking Operation Modes.
10. Blue Screen Noise Elimination Function.
11. Built-in Still Function.
12. Simple Recording Timer with Auto Return.
13. Automatic TV/VCR Output Signal Selector (VCR Play Mode Preference).
14. Built-in DEW Warning Indicator and DEW Sensor.
15. Electronic 4-Digit Tape Counter.
16. Built-in RF Converter. (RF Output;VHF 3 or 4 CH. Switchable)
17. Full Automatic Playback Function.
18. Digital Tracking Function.
19. Built-in MTS(Multichannel TV Sound) Decoder.
20. Stereo Sound Recording and Playback.

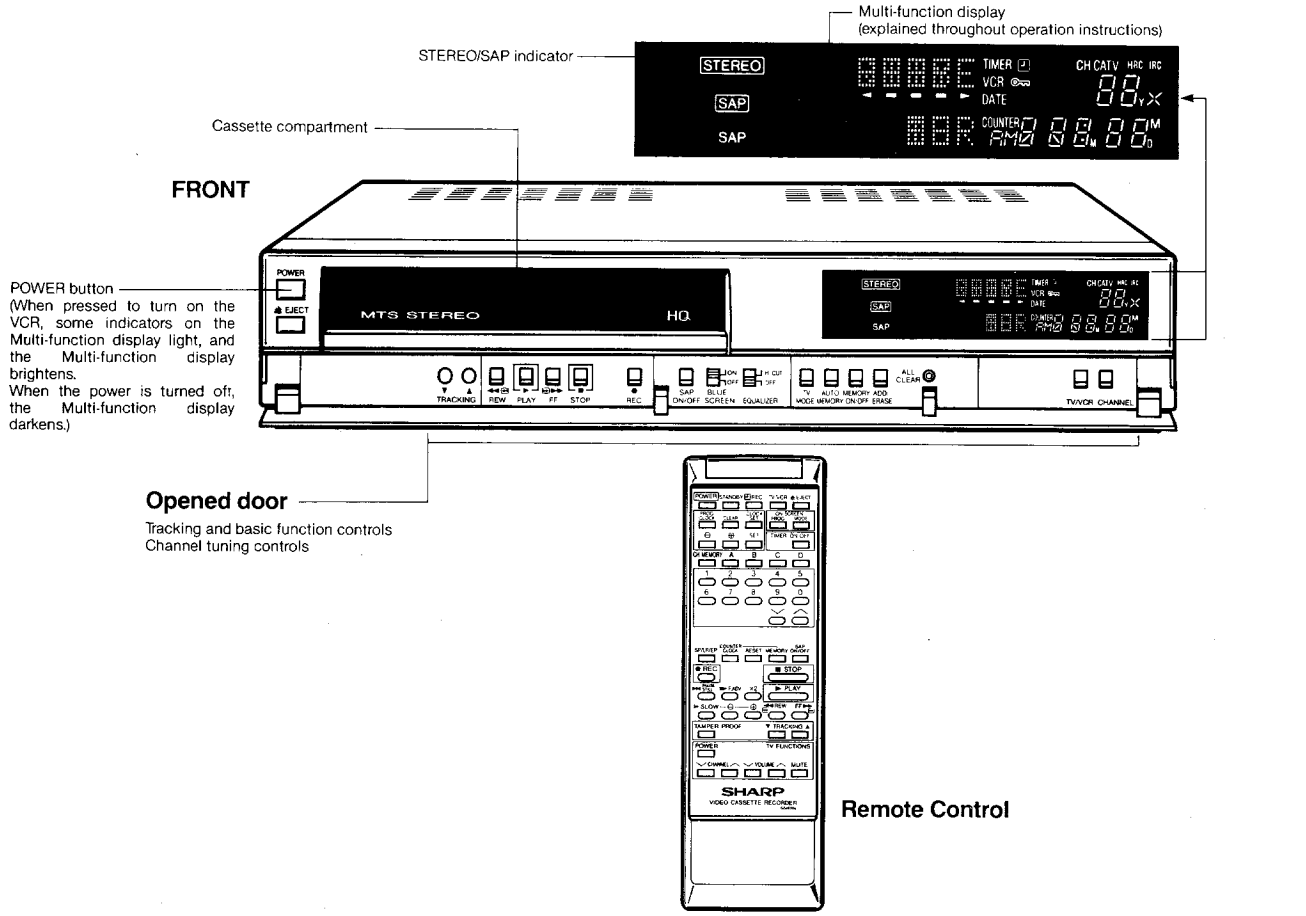
SPECIFICATIONS

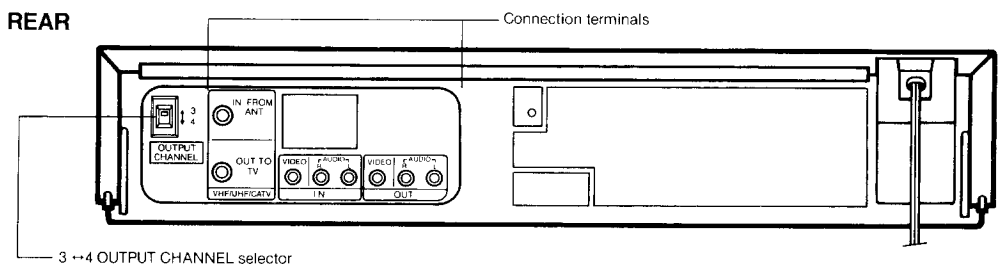
Recording system:	2 rotary heads, helical scanning system. Luminace signal; FM recording Chroma signal; Low-band conversion direct recording
Video signal:	NTSC system
Tape speed:	SP (33.35 mm/sec.) LP (16.67 mm/sec.) EP (11.12 mm/sec.)
Tape width:	12.7 mm (nominal) (1/2")
Video cassette tape:	VHS video cassette tape
Record/play time.	Max. 8 hours (with T-160 tape)
Receiving channel:	VHF; channels 2 thru 13 UHF; channels 14 thru 83 CATV; channels A-8, A-5 to A-1, A to W W + 1 to W + 58
Antenna:	VHF/UHF 75 ohm
Video signal	
Input line:	0.5~2.0Vp-p, 75 ohm unbalanced
Output line:	1.0Vp-p, 75 ohm unbalanced
Horizontal resolution:	230 lines (SP Mode)
Video S/N ratio:	45 dB (SP Mode)
Audio input:	Line; - 8 dBm (316 mV)
Audio output:	Line; - 5 dBm (436 mV)
Audio frequency characteristic:	80 Hz to 10 kHz (SP Mode)
Wow and Flutter:	SP mode 0.3% Max.(Peak) (with T-120 tape) EP mode 0.5% Max. (Peak) (with T-120 tape)
Audio S/N ratio:	43 dB (SP Mode)
Timer display:	AM/PM display
Rewind/fast foward time:	Within 5 minutes with T-120 tape
Allowable ambient temperature:	5°C to 40°C (41°F to 104°F)
Operating position:	Horizontal
Operating humidity:	Below 80% RH
Storage temperature:	-20°C to 55°C (-4°F to 131°F)
Power source:	120V AC, 60 Hz
Power consumption:	26W
Dimensions:	43(W) x 34,5(D) x 8.2(H)cm 16-15/16" (W) x 13-37/64" (D) x 3-15/64" (H)
Weight:	6.1kg (13.45lbs.)
Accessories included:	• VHF connecting cable • Owner's manual • Remote control unit • Two Batteries (size AAA/ SUM- 4) • Warranty card

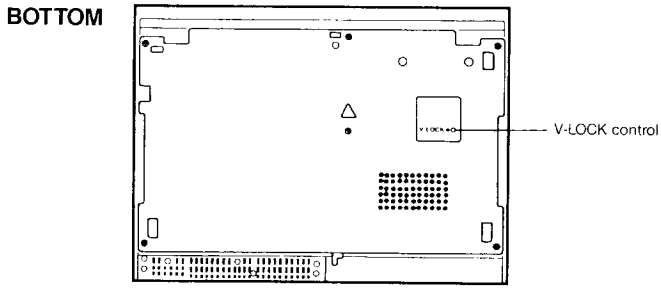
Notice: Any part of the specifications may be changed for improvement without notice.

LOCATION AND IDENTIFICATION OF CONTROLS

MAJOR COMPONENTS OF YOUR VCR

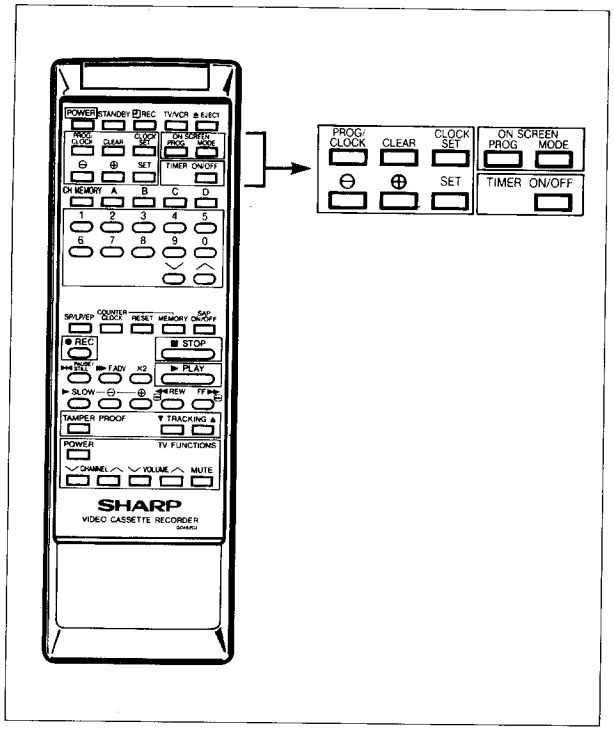






RECORDING WITH THE TIMER

The timer has 8 program positions, which allow 8 programs to be set for automatic recording over a one year period. Each of the programs can be set to record on a daily or weekly basis until the tape reaches its end.



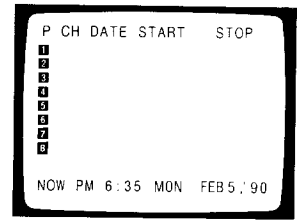
Example: To record a TV program in the SP mode on Channel 7 on the first program position starting at 9:05 PM and stopping at 10:35 PM on Friday, March 30th, 1990. The present time is 6:35 PM on Monday, February 5th, 1990.

❶ Turn on your TV and tune it to channel 3 or 4, according to the 3↔4 OUTPUT CHANNEL selector. (See CONNECTIONS)

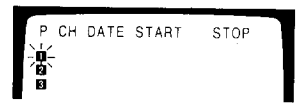
❷ Load a cassette with the safety tab in place. Power will turn on automatically.

❸ Set the SAP ON/OFF button to the required mode.

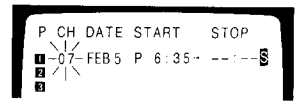
❹ Press the ON SCREEN PROG button on the Remote Control. Check the actual time. If incorrect, reset as shown in "SETTING THE CLOCK".



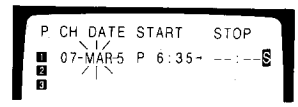
❺ Press the PROG/CLOCK button to select the program setting mode.
The program number indicator will start flashing.
Select the desired program number with the ⊕ or ⊖ button. (Set to 1)
Press the SET button.



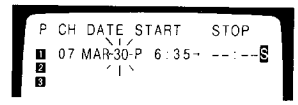
❻ Select the desired channel number with the ⊕ or ⊖ button. (Set to 07)
Press the SET button.



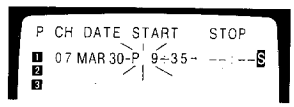
❼ Select the desired month with the ⊕ or ⊖ button. (Set to MAR.) Press the SET button.
"WK" and Day indicates weekly recordings.
"DAILY" indicates daily recordings.



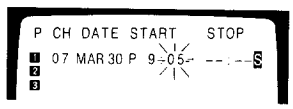
❽ Select the desired date with the ⊕ or ⊖ button. (Set to 30.) Press the SET button.



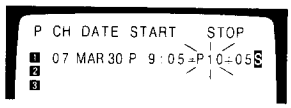
❾ Press the ⊕ or ⊖ button to select the starting hour. (On the TV screen, "A" indicates AM, and "P" indicates PM.) (Set to P 9) Press the SET button.



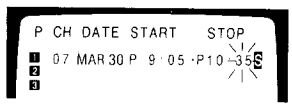
❿ Press the ⊕ or ⊖ button to select the starting minutes. (Set to 05) Press the SET button.



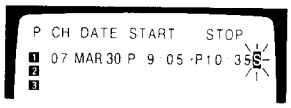
⓫ Press the ⊕ or ⊖ button to select the stopping hour. (Set to P 10) Press the SET button.



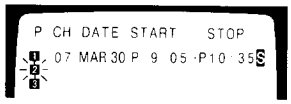
⓬ Press the ⊕ or ⊖ button to select the stopping minutes. (Set to 35) Press the SET button.



⓭ Set the desired recording speed (SP, LP or EP) with the ⊕ or ⊖ button on the Remote Control. (On the TV screen, "S" indicates SP mode, " L " indicates LP mode and " E " indicates EP mode.) (Set to S) Press the SET button.
This completes the timer recording set-up procedure for the first TV program position.



⓮ The next program number starts flashing. If another program is to be set, press the SET button and repeat the procedure from Step ❻ on. If by mistake, the stopping time indicator is set to the same time as the starting time and the SET button is pressed, the program number indicator will start flashing and all the input data of the program will remain the same, indicating that you need to set it again. In this event, press the SET button again, and repeat the procedure from Step ❻ on.



⓯ When all program set-up is completed, press the PROG/CLOCK button.

⓰ Press the ON SCREEN PROG button to return the screen to normal TV picture.

⓱ Press the TIMER button.
The "TIMER" indicator shows up on the Multi-function display and the VCR turns off.

NOTES:
- If the video cassette runs out before recording all the programs, the VCR will stop, eject the cassette and shut off automatically.
- If power is interrupted for more than twenty minutes, all timer settings may be cancelled.
- If the TIMER ON/OFF button is pressed when there is no cassette inserted, the TIMER indicator flashes for five seconds indicating that timer recording is not possible.
- If the TIMER ON/OFF button is pressed while a cassette with the safety tab removed is inserted, the TIMER indicator flashes and the cassette is ejected.
- If the TIMER is on, regular VCR operation and setting/cancelling a program is not possible. Press the TIMER ON/OFF button to cancel the timer, then turn on the VCR.
- To stop timer recording, press the STOP button.
- If the PROG/CLOCK, ⊕ or ⊖ or SET button is not pressed within 10 seconds while the program number is flashing, the mode automatically returns to the normal mode.
- If no buttons are pressed within one minute while setting a program, the mode automatically returns to the normal mode.
- A program cannot be set unless the recording stop time is set.

Checking/Cancelling Timer Settings

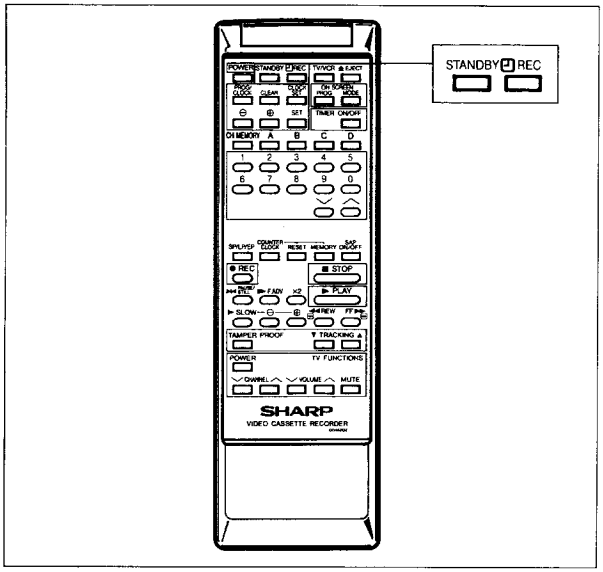
Checking Timer Settings

❶ If the TIMER indicator is lit on the display, press the TIMER ON/OFF button once to disengage the timer mode.
❷ Press the POWER button to turn on the VCR.
❸ Please be sure that the TV is on and tuned to Channel 3 or 4 according to the VCR's 3 ↔ 4 OUTPUT CHANNNEL selector.
❹ Press the ON SCREEN PROG button on the Remote Control. Program contents will appear on the screen. If you need to change any setting, press the PROG/CLOCK button to select the program you need to change and correct the program contents by using the ⊕, ⊖ and SET buttons.
❺ Press the TIMER ON/OFF button to return to the timer mode.
The VCR will turn off automatically.

Cancelling Timer Settings

❶ If the TIMER indicator is lit on the display, press the TIMER ON/OFF button once to disengage the timer mode.
❷ Press the POWER button to turn on the VCR.
❸ Please be sure that the TV is on and tuned to Channel 3 or 4 according to the VCR's 3 ↔ 4 OUTPUT CHANNEL selector.
❹ Press the ON SCREEN PROG button on the Remote Control. Program contents will appear on the screen. Press the PROG/CLOCK button and the program number will start flashing. Press the ⊕ or ⊖ button to select the program you want to cancel.
❺ Press the CLEAR button to cancel that particular program.
❻ Press the ON SCREEN PROG button to return to the normal mode, or press the TIMER ON/OFF button to return to the timer mode.

SIMPLE RECORDING TIMER (with Auto Return)



The Simple Recording Timer enables you to record one program starting within 24 hours.

Turn on your TV and tune it to Channel 3 or 4 according to the 3↔4 OUTPUT CHANNEL selector. The Simple Recording Timer can be set by using the Remote Control and TV Screen.

Example: To record a TV program in the SP mode on Channel 2, starting at 2:00 PM and stopping at 3:00 PM. The present time is 8:43 AM.

❶ Load a cassette, making sure the erasure protection hole is covered. Power will turn on automatically.

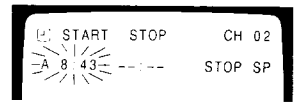
❷ Set the TV/VCR button to "VCR".

❸ Select the required channel with the 10 channel buttons or CHANNEL UP or DOWN buttons on the Remote Control. (Set to 02)

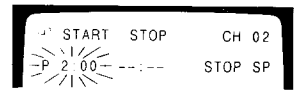
❹ Set the SAP ON/OFF button to the required mode.

❺ Set the recording speed (SP, LP or EP) with the SP/LP/EP button on the Remote Control. (Set to SP)

❻ Press the STANDBY button to set the starting time. Then the present time shows on the TV screen.



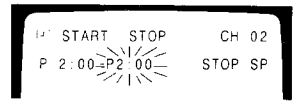
❼ Repeatedly press the STANDBY button to raise the current minutes setting to a number divisible by 10 so the starting time is set. (Set to P 2:00)



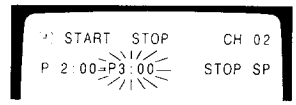
Press the ⊕ or ⊖ button to change the minutes setting if necessary.

If you want to start recording immediately and set only the stopping time, skip steps ❻ and ❼.

❽ Press the ⏺ REC button to set the stopping time.



❾ Each press of the ⏺ REC button increases the stopping time by 10 minutes. (Set to P 3:00)
Press the ⊕ or ⊖ button to change the minutes setting if necessary.



Make sure the ⏺ indicator is being lit on the Multi-function display.

❿ You can turn off the power after the setting procedure is completed. The recording will start when the starting time comes.

Auto Return Function

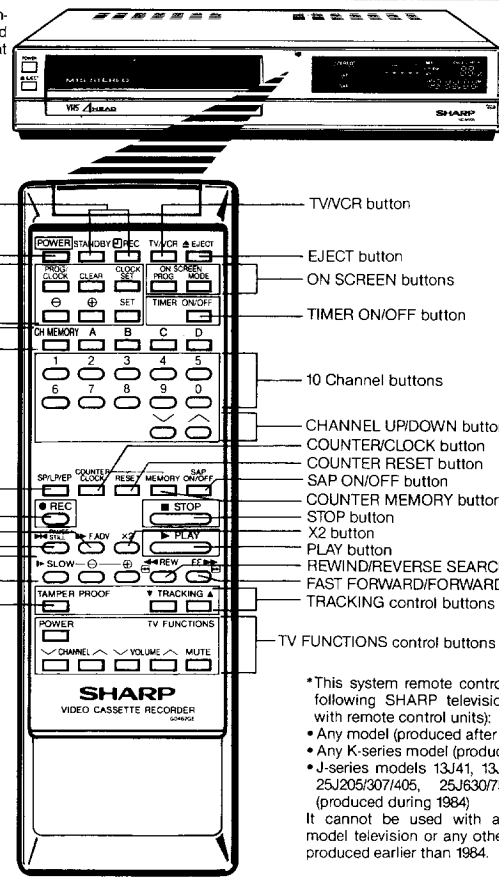
When the Simple Recording Timer is set, the Auto Return function will be automatically engaged. This function automatically returns the tape to the recording start point, ejects the tape and shuts off the power after recording has been completed.

If the TIMER is on, the Auto Return function will be disengaged.

NOTES:
- Press the STOP button or the CLEAR button to stop recording.
- Simple Recording Timer can only be set during the stop or recording mode.
- To cancel the Simple Recording Timer, turn on the power and press the CLEAR button (on the Remote Control).
- When setting the Simple Recording Timer while the TV is not receiving station signals, set the BLUE SCREEN selector to ON. (In this case, the TV screen is blue.) If the BLUE SCREEN selector is set to OFF while the TV is not receiving station signals, the Simple Recording Timer cannot be set.

REMOTE CONTROL

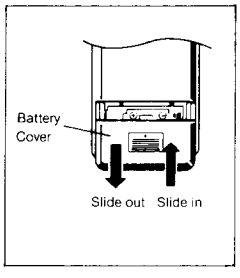
The Remote Control lets you operate your VCR at a distance. It has all the major controls necessary for turning on/off your VCR, viewing the TV, changing the channels and playing back or recording a video cassette. Just aim the front of the Remote Control at your VCR and press the control buttons as you would on your VCR.



*This system remote control can operate the following SHARP television sets (equipped with remote control units):
- Any model (produced after 1985)
- Any K-series model (produced during 1985)
- J-series models 13J41, 13J350/370, 19J91/93, 25J205/307/405, 25J630/750 and 20J650 (produced during 1984)

It cannot be used with any other J-series model television or any other Sharp television produced earlier than 1984.

Replacing the Batteries



If the Remote Control does not operate or fails to function normally, replace the batteries. The Remote Control operates on two "AAA" 1.5 volt batteries, available at electronics and camera stores.

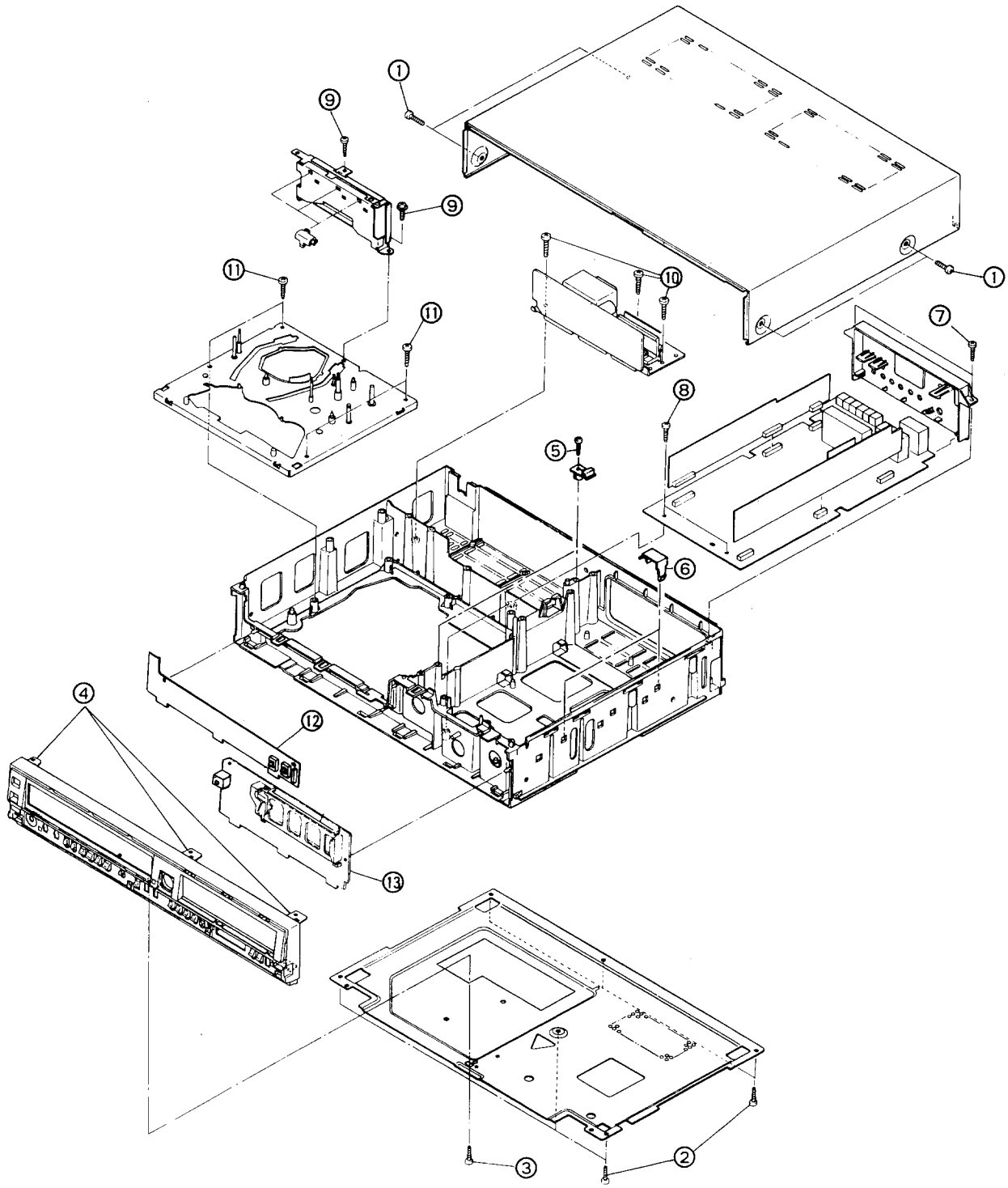
❶ Slide the battery cover out and remove the old batteries.

❷ Insert new batteries, matching their polarities (⊕ and ⊖) to the markings inside the Remote Control.

❸ Replace the cover.

DISASSEMBLY AND REASSEMBLY

① Remove four upper cabinet screws ①.
② Remove six bottom plate screws ②.
③ Remove one front panel screw ③.
④ Release three clips ④ and remove the front panel.
⑤ Remove two Hi-Fi holder screws ⑤ and the two Y/C holders ⑥.
⑥ Remove two antenna terminal plate screws ⑦.
⑦ Remove the two main PWB screws ⑧.
⑧ Remove two H-amp PWB screws ⑨.
⑨ Remove three power unit screws ⑩.
⑩ Remove four machanism chassis screws ⑪.
⑪ Release the clips and remove the operation PWB ⑫.
⑫ Release the clips and remove the timer PWB ⑬.

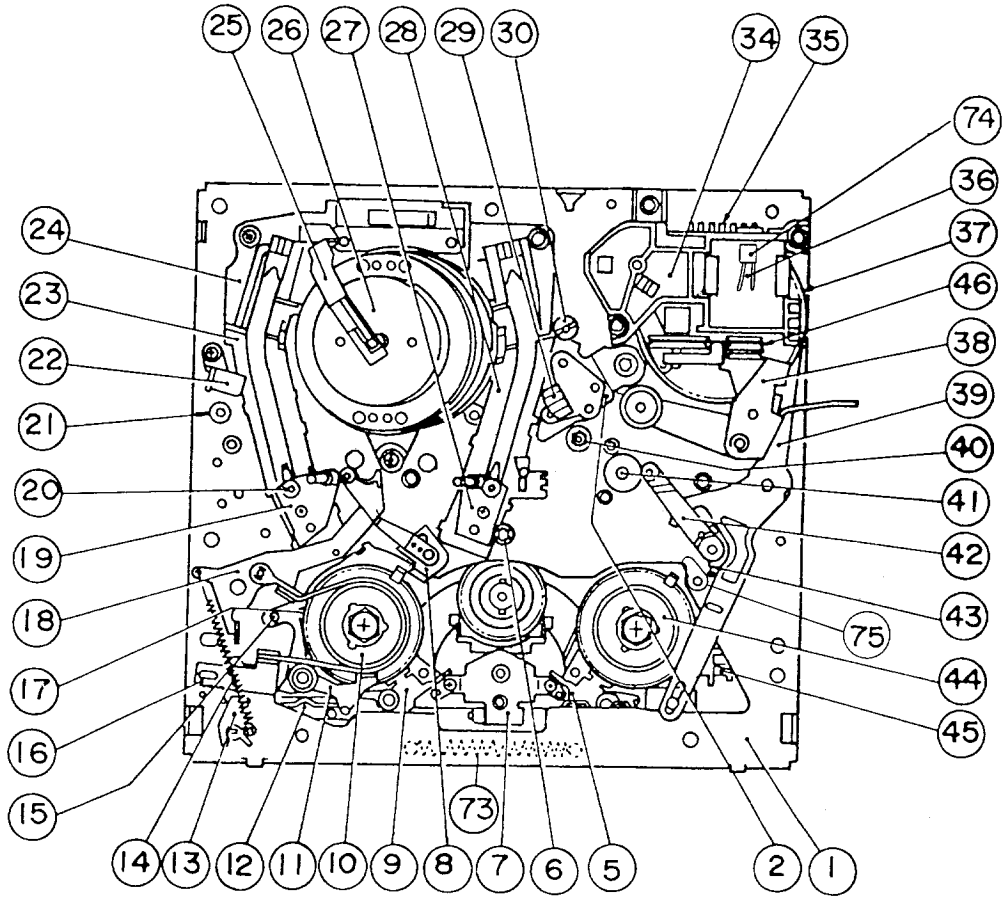


LOCATION LIST OF MECHANICAL PARTS

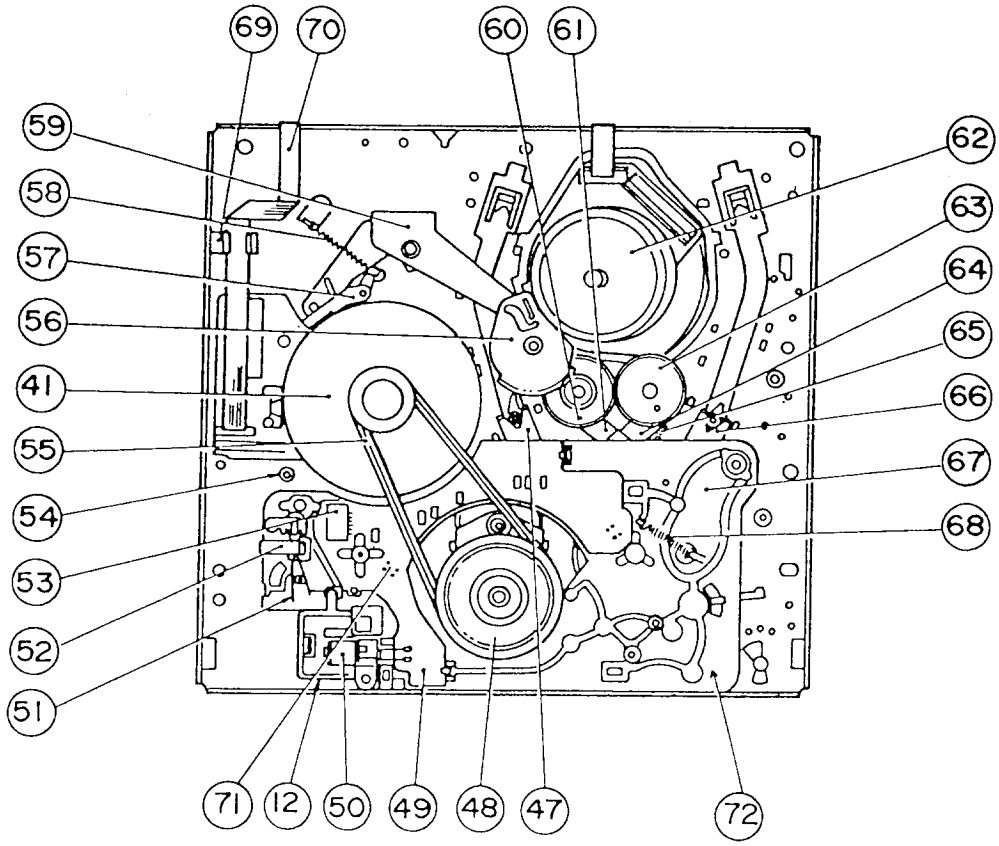
No.	Part Name	No.	Part Name
1	Main chassis ass'y	38	Pinch roller lever ass'y
2	A/C head arm	39	Relay shifter lever
3	————	40	Retaining tape guide
4	————	41	Capstan D.D.motor
5	Main take-up brake lever	42	Reverse guide
6	Cassette LED	43	Reverse guide spring
7	Idler gear ass'y	44	Take-up reel disk
8	Supply reel retainer ass'y	45	Video search brake lever
9	Main supply brake lever	46	Loading belt
10	Supply reel disk	47	Take-up pole base slider
11	Back tension lever	48	Reel pulley
12	Brake shifter	49	Reel sensor PWB
13	Tension spring hook plate	50	Brake solenoid
14	Tension spring	51	Shifter spring
15	Tension release lever	52	Shifter spring cover
16	Tension band ass'y	53	Connector
17	Auxiliary fast forward brake lever	54	Reverse guide spring
18	Tension arm ass'y	55	Reel belt
19	Supply pole base ass'y	56	Loading relay gear
20	Guide roller ass'y	57	Slow brake lever
21	Supply impedance roller	58	Slow brake spring
22	Full erase head ass'y	59	Relay gear drive lever
23	Supply loading rail	60	Take-up loading gear
24	Drum base	61	Take-up loading arm ass'y
25	Ground brush ass'y	62	Drum D.D. motor ass'y
26	Drum ass'y	63	Supply loading gear
27	Take-up pole base ass'y	64	Supply loading arm ass'y
28	Take-up loading rail	65	Loading reciprocating spring
29	A/C head ass'y	66	Supply pole base slider
30	X-position adjusting nut	67	Reel block chassis
31	————	68	Auxiliary fast forward brake spring
32	————	69	Full flat cable holder
33	————	70	Full flat cable(Drum D.D. motor)
34	Loading block ass'y	71	Reel sensor
35	Cam switch	72	Reel block
36	Loading motor	73	Main brake spring
37	Master cam	74	Dew sensor
		75	Take-up reel Retainer

LOCATION OF MECHANICAL PARTS

- TOP VIEW



- BOTTOM VIEW



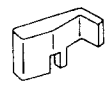
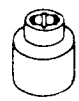
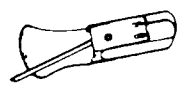
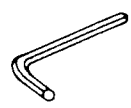
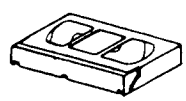
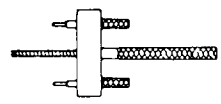
ADJUSTMENT, REPLACEMENT, ASSEMBLY AND CLEANING OF MECHANICAL UNITS

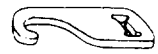
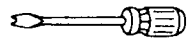
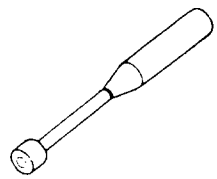
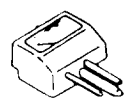
Here we will describe a relatively simple service work in the field, not referring to the more complicated repairs which would require the use of special equipment and tools (drum assembly replacement, for example).

We are sure that the easy-to-handle tools listed below would be more than handy for periodical maintenance to keep the machine in its original working condition.

TOOLS NECESSARY FOR ADJUSTING THE MECHANICAL UNITS

The following tools are required for proper service and satisfactory repair.

No.	Jig Item	Part No.	Price Code	Configuration	Remarks
1	Reel Disk Height Adjustment Jig	JiGRH0002	BR		
2	Master Plane	JiGMP0001	BY		
3	A/C Head Tilt Adjustment Jig	JiGACH-F18	BU		
4	Torque Gauge (90g)	JiGTG0090	CM		For checking and adjusting the torque of take-up and supply reel disks.
	Torque Gauge 1.2 kg (JiGTG1200)	VCRT00L-8	CN		
5	Gauge Head(JiGTH0006)	VCRT00L-7	AW		
6	Cassette Torque Meter	JiGVHT-063	CZ		For checking and adjusting the torque of take-up and supply reel and for measuring tape back tension.
7	Tension Gauge (300g) (JiGSG0300)	VCRT00L-10	BF		There are two gauges used for the tension measurements, 300 g and 2.0 kg.
	Tension Gauge (2.0kg) (JiGSG2000)	VCRT00L-11	BS		
8	Hex Wrench (0.9mm) (JiGHW0009)	VCRT00L-12	AE		For loosening or tightening special Hexagon type screws.
	Hex Wrench (1.2mm) (JiGHW0012)	VCRT00L-13	AE		
	Hex Wrench (1.5mm) (JiGHW0015)	VCRT00L-14	AE		
9	Alignment Tape (NTSC SP) (VROATSV)	VCRT00L-16	CD		Tracking width (LCH:58μ. RCH:58μ)
	Alignment tape	VROLBZUS	CB		Tracking width (LCH:58μ. RCH:40μ)
10	Upper drum remover	JiGDT-0001	BG		

No.	Jig Item	Part No.	Price Code	Configuration	Remarks
11	Tension Gauge Adapter	JiGADP003	BK		
12	Tape Guide Adjustment Tool	JiGDRiVERH-4	AP		This jig can also be used for x-position adjustment.
13	Tension Band and Plate Adjustment Tool	JiGDRiVER-6	BM		
14	Torque Driver (5kg)	JiGTD1200	CB		This is used to screw down plastic made parts.
15	Box Driver	JiGDRiVER110-7	AS		For height adjustment of the A/C head.
		JiGDRiVER110-4	AV		For height adjustment of the retaining guide.
16	Retaining Guide Height Adjustment Jig	JiGGH-F18	BU		
17	Reverse Guide Height Adjustment Jig	JiGRVGH-F18	BU		This Jig is used for height adjustment of the reverse guide.
18	Tape Tension Gauge	(Locally available)	–		For measuring back tension of runing tape.

NOTE:
JiGMA0001, (not listed here), includes JiGMP0001(No.2, master plane) and JiGRH0001 (Reel height adjustment jig).
JiGRH0002 (No.1) with JiGMP0002 covers more height range compared to JiGRH0001, the previous one.

MECHANICAL PARTS REQUIRING PERIODICAL INSPECTION

Use the following table as a guide to maintain the mechanical parts in good operating condition.

Parts \ Maintained	500 hrs.	1000 hrs.	1500 hrs.	2000 hrs.	3000 hrs.	Remarks
Guide roller ass'y	□	□	□	□	□	Abnormal rotation or significant vibration requires replacement.
Supply impedance roller	□	□	□	□	□	
Supply impedance roller (inner hole and shaft)		□		□	□	Clean with pure high quality isopropyl alcohol.
Supply impedance roller flange	□	□	□	□	□	Clean tape contact part with the specified cleaning liquid.
Retaining guide	□	□	□	□	□	
Slant pole	□	□	□	□	□	
Video head	□	○□	□	○□	○□	Clean tape contact area with the specified cleaning liquid.
Full-erase head	□	□	□	□	□	
A/C head	□	□	□	□	□	
Pinch roller	□	□	□	□	○□	Clean rubber and rubber contact area with the specified cleaning liquid.
Reel belt		□		○		
Loading belt		□		○		
Capstan loading belt		□		○		
Reel block*				○		
Tension band ass'y					○	
***See the table below for servicing the reel block parts.**						
Supply/take-up reel disks		□ △		□△○		Clean with pure high quality isopropyl alcohol.
Video serch brake lever				○		
Idler gear ass'y				○		
Reel Pulley		□△		□△		
Main supply/take-up brake levers				○		

NOTE: ○: Part replacement.
□: Cleaning (For cleaning, use a lint-free cloth dampened with pure isopropyl alcohol).
△: Oil refilling (The indicated point should be lubricated with high quality spindle oil every 1000 hrs).

If the reading is out of the specified value, clean or replace the part.

REMOVAL AND REASSEMBLY OF CASSETTE HOUSING CONTROL ASSEMBLY

Notes:

1. During removal and reassembly, be careful not to strike the nearby guide pin, drum, etc.
2. Before removal or reassembly, be sure to unplug the recorder from the AC outlet.
3. When removing and attaching the cassette loading belt, be careful to keep it free from grease.

- **Removal**

1. Put the unit in the cassette eject position.
2. Remove the cassette loading belt ① .
3. Disconnect the FFC (Full Flat Cable) ② at the right side of the cassette housing control assembly.
   Note: Be careful not to break the FFC.
4. Remove two cassette housing installation screws.
5. Move the cassette housing control assembly (Fig. 1-1) in the direction of arrow ⇒ Ⓑ, and pull it out straight upward.

- **Reassembly**

1. Insert the tabs of the cassette housing control assembly into the mechanism chassis, move it in the direction of arrow ⇒ Ⓐ, and secure temporarily.
   Check to see if the cassette housing control assembly is in the correct position, and then tighten the two screws.
2. Hook the cassette loading belt ① back in place.
3. Connect the FFC ② in place.

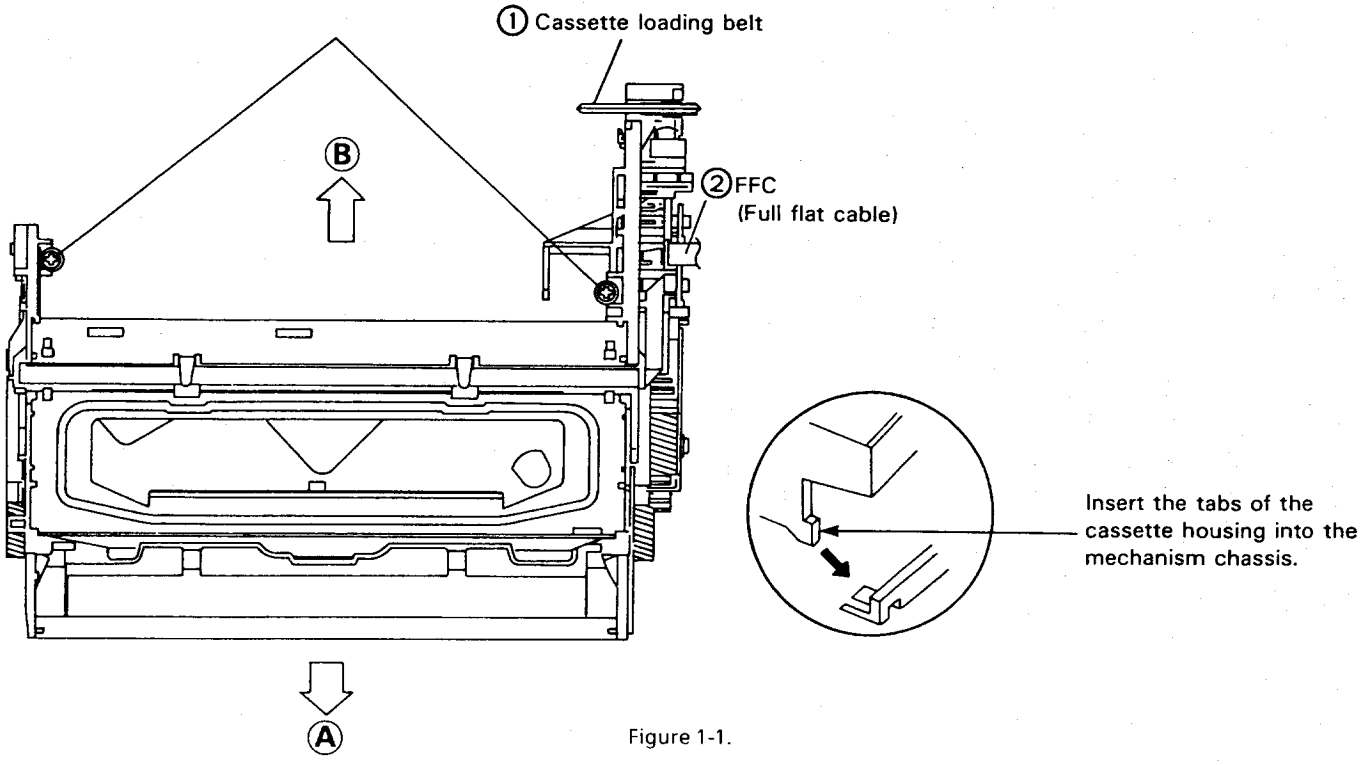


Figure 1-1.

REPLACEMENT OF WORM WHEEL ASSEMBLY

- **Removal (Fig. 1 - 2)**

1. Unsolder the cassette switch connector from the start sensor PWB ①
2. Release two latches Ⓐon the cassette housing frame (R), and remove the PWB.
3. Remove screw ② to detach the worm bracket ③.
   Note: Be careful not to lose bearing ④ which may come off the worm bracket.
4. Remove the worm shaft assembly ⑤, pulley ⑥ and cassette loading belt ⑦ all from the cassette housing frame (R).
5. Finally pull the worm wheel assembly out of the boss of the cassette housing frame (R).

- **Reassembly (Fig. 1-2)**

1. Turn the phase gear ⑧ clockwise until the slider's movement in the cassette inserting direction stops.
2. Set up the worm wheel gear assembly onto the boss on the cassette housing frame (R), matching the mark Ⓖ on the phase gear ⑧ with the mark Ⓗ on the worm wheel gear.
   Note: Make sure that the slider pin is in the groove of the drive gear arm.

3. Install the pulley ⑥ and apply the cassette loading belt ⑦ both on the worm shaft assembly ⑤. Couple the clutch ⑩ to the clutch lever ⑨. And mount them together in the cassette housing frame (R).
4. Attach the worm bracket ③ to the worm shaft assembly ⑤. Place them onto the boss on the cassette housing frame (R).

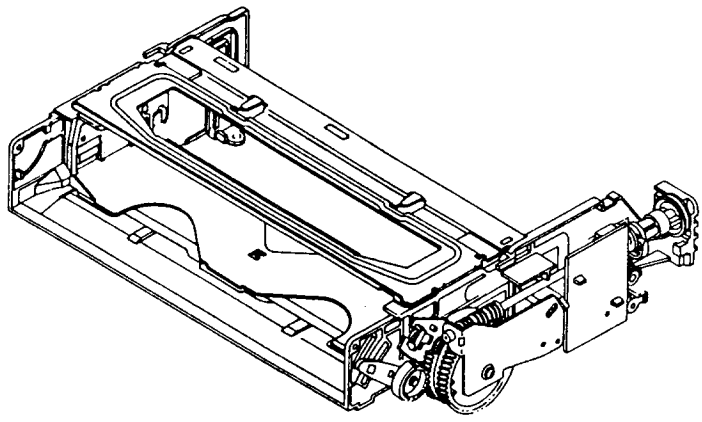
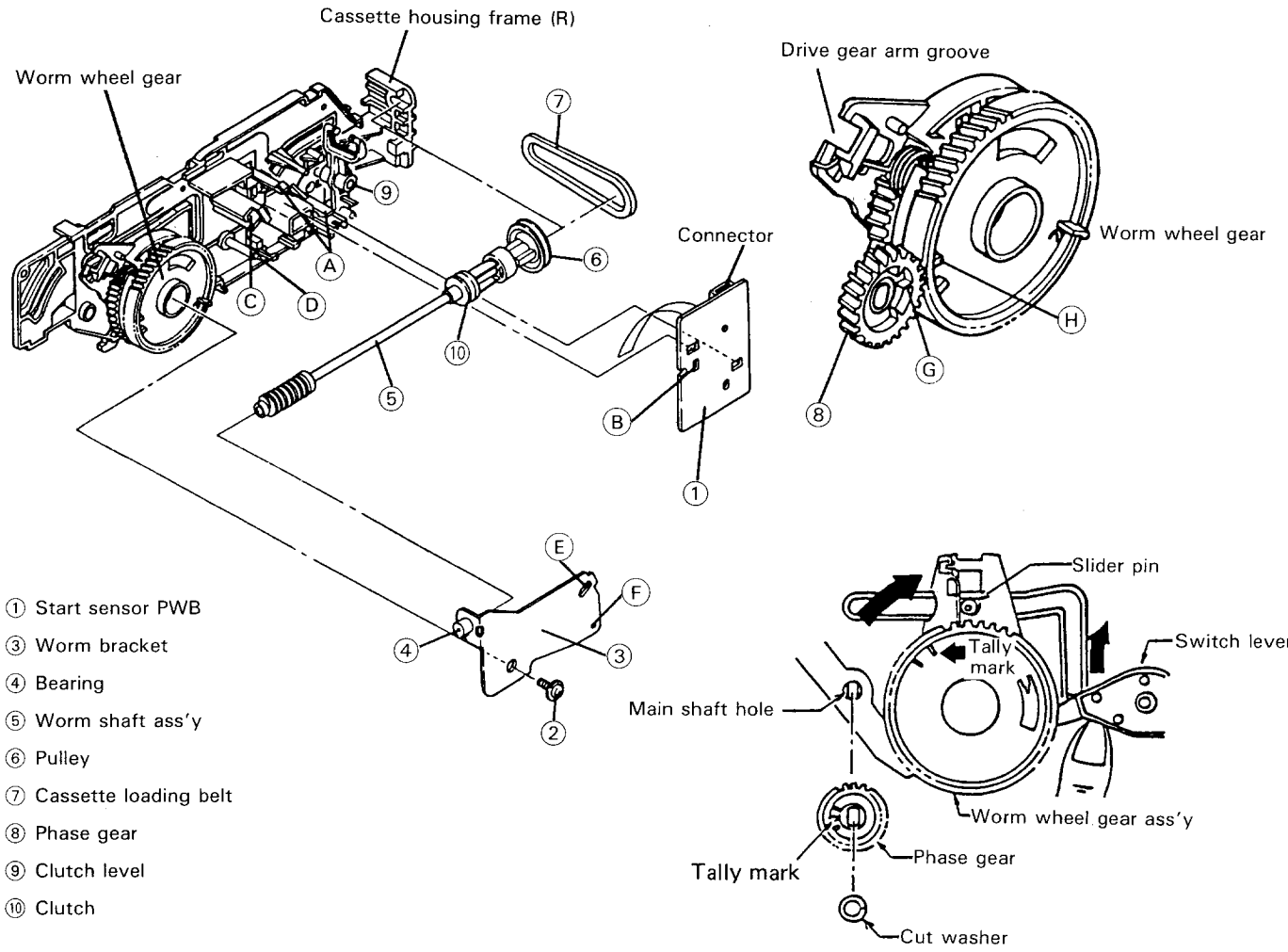


Figure 1-2 (a).

5. Tighten screw ②.
   Note: Make sure that the parts Ⓒ and Ⓓ of the cassette housing frame (R) are properly engaged with the parts Ⓔ and Ⓕ of the worm bracket ③.
6. Hook the start sensor PWB ① on the two positions Ⓐ on the cassette housing frame (R).
   Note: Check that the switch connector is right in the cassette switch mounting hole Ⓑ.
7. Finally resolder the cassette switch connector to the start sensor PWB.

Notes:

1. Be careful not to break the hole on the boss when tightening the screw ②.
2. Keep in mind that the clutch switching lever should be in correct position. The mechanism might malfunction even if the lever comes slightly out of position.



① Start sensor PWB
③ Worm bracket
④ Bearing
⑤ Worm shaft ass'y
⑥ Pulley
⑦ Cassette loading belt
⑧ Phase gear
⑨ Clutch level
⑩ Clutch

Ⓑ Cassette SW mounting hole

Figure 1-2 (b).

- **Reassembly of drive gear (Fig.1- 3)**

1. Pass the tip Ⓑ of the drive gear spring (R) ② through the square hole Ⓐ of the drive gear (R) ① to the hook the spring in position.
2. Hook one end Ⓓ of spring ③ to the catch Ⓒ .
3. Hook the other end Ⓔ of the spring to the catch Ⓕ of the worm wheel ④.
4. Fit the drive gear (R) ① to the worm wheel ④ so that the catch Ⓖ and boss Ⓙ on the drive gear (R) are in the square hole Ⓗ and round hole Ⓘ, respectively.

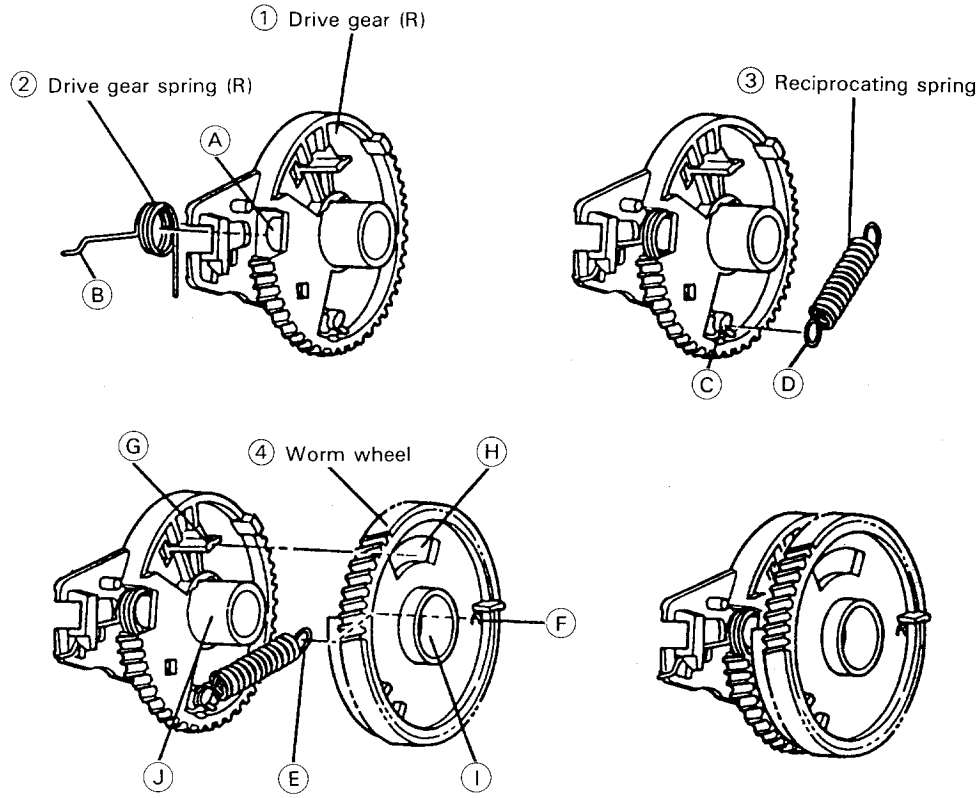


Figure 1-3.

REPLACEMENT OF CASSETTE LOADING BELT

- **Replacement (Fig. 1-4)**

1. Remove the start sensor PWB and worm bracket from the cassette housing frame (R).
2. Remove the worm shaft assembly, pulley and cassette loading belt from the cassette housing frame (R).
3. Replace the cassette loading belt with a new one.

Notes:

1. Do not overtighten screw ② which holds the worm bracket in position. The specified tightening torque is 5.0 ± 0.5kg. cm.
2. Make sure that the cassette loading belt, being applied in the cassette housing frame (R), is free from grease. If stained with grease, clean the belt.
3. Finally check the clutch switching lever for its specified points. (See next page Fig 1-5(b)).

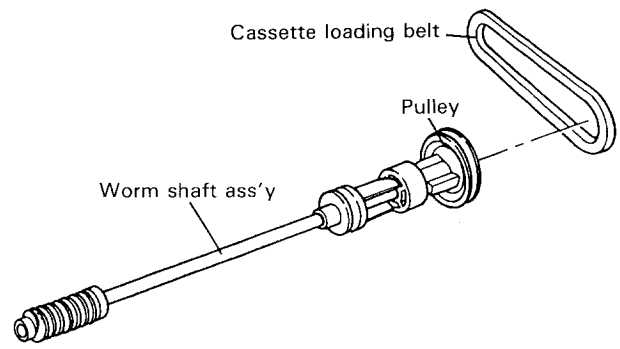


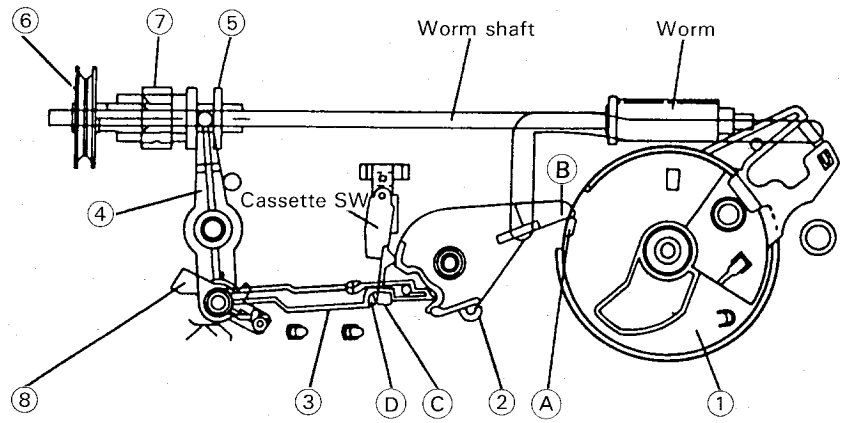
Figure 1-4.

CHECKING THE CLUTCH SWITCHING LEVER

- **Checking (Fig. 1-5)**

When removing and attaching the clutch switching lever from and to the mechanism chassis, check if the lever is in the position as shown below. If out of this position, malfunction might result.

1. First, make sure that the rib Ⓐ of the drive gear (R) ① and the tip Ⓑ of the switch lever ② are in their correct positions.
2. Check also that the rib Ⓒ and the catch Ⓓ are in their proper positions.
3. Finally be sure that the positional relation between the clutch lever ④ and the clutch ⑤, a well as between the clutch ⑤ and the pulley ⑥, are as specified. (See Fig. 1-5(b)).



① Drive gear (R)
② Switch lever
③ Clutch lock lever
④ Clutch lever
⑤ Clutch
⑥ Pulley
⑦ Coupling
⑧ Clutch release lever

Figure 1-5 (a).

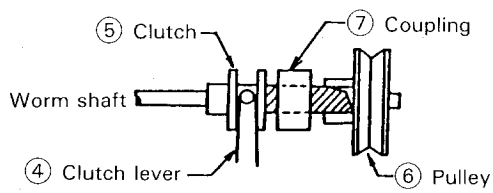


Figure 1-5 (b).

- **Resetting (Fig. 1-6)**

Take the following steps to reset the clutch ⑤ if it is unlocked or if the switch lever ② and clutch lock lever ③ are unlocked.

1. Turn the coupling ⑦ clokwise (as viewed from the front of the unit) until the slider comes to the position indicated below.
   Note: Notice that the slider is equipped with the lock mechanism. Unlock the slider, therefore, before shifting the slider.
2. Push the clutch release lever ⑧ in the direction of arrow Ⓔ until the clutch lock lever ③ becomes tightly locked by the part Ⓒ of the cassette housing frame (R).
3. Then turn the coupling ⑦ counterclockwise until the slider reaches the cassette insertion opening and the reciprocating spring is activated.
   Note: There is no need to lock the slider. Just keep shifting the slider.

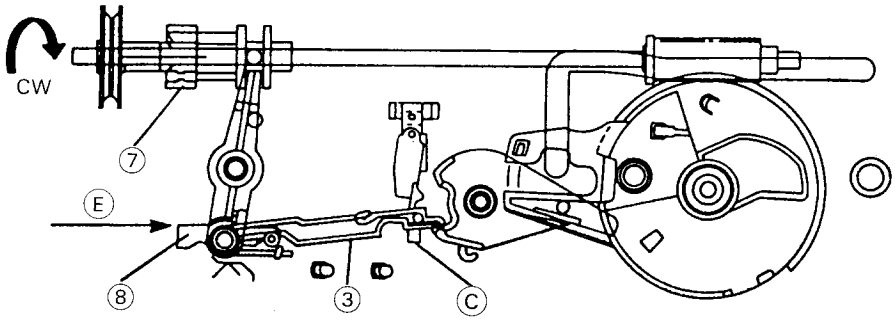


Figure 1-6.

REPLACEMENT OF LOCK RELEASE LEVER

- **Removal (Fig. 1-7)**

1. Turn the coupling clockwise until the slider ① comes to the cassette down position.
   Note: Before shifting, unlock the slider.
2. Slightly widen the cassette housing frames (R) and (L) to unhook the parts Ⓐ of the slider holders (R) and (L) off the grooves of the above frames.
3. Press the catch Ⓑ on the slider holder (R) ②, and let the slider ① go off this holder in the direction of arrow Ⓒ.
4. Take the lock release lever ③ out of the slider holder (R) ②.

- **Reassemdly (Fig. 1-7)**

1. Attach the lock release lever ③ to the slider holder (R) ②.
2. Fit the slider holder (R) ② to the slider ①.
3. Slightly widen the cassette housing frames (R) and (L), and set the parts Ⓐ of the slider holders (R) and (L) to the grooves of the cassette housing frames (R) and (L).
   Note: Make sure of the following fitting: Fitting between the parts Ⓐ of the slider holders (R) and (L) and the grooves of the cassette housing frames (R) and (L), as well as between the drive gear arms and the slider holders (R) and (L).
4. Turn the coupling counterclockwise until the slider ① comes to the cassette insertion opening.

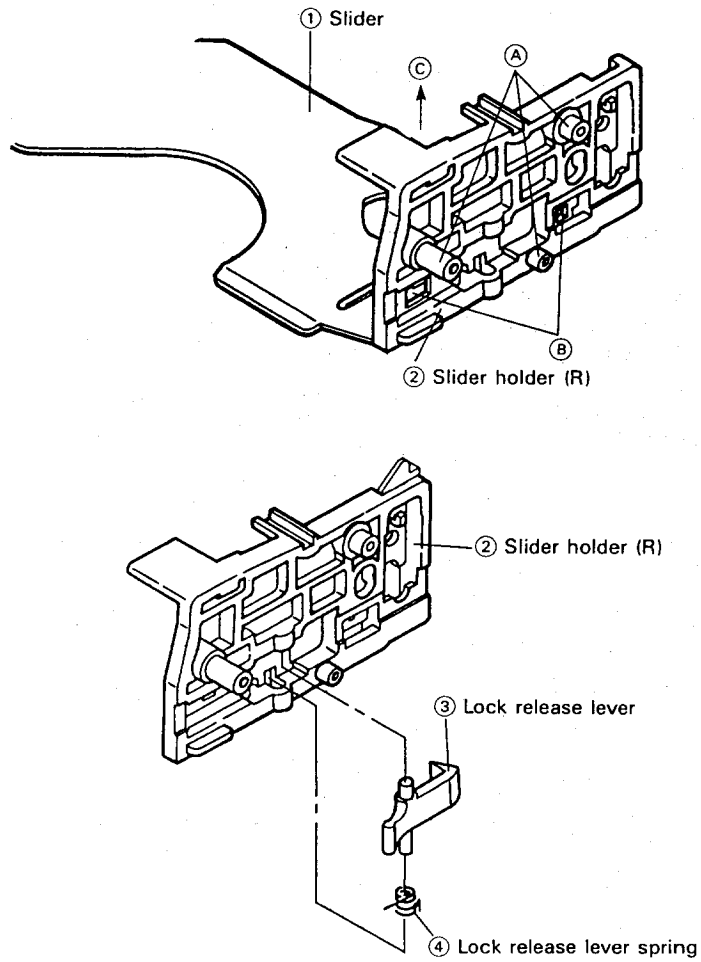


Figure 1-7.

TO RUN A TAPE WITHOUT THE CASSETTE HOUSING CONTROL ASSEMBLY

1. Open the lid of a cassette tape by hand and hold it with a piece of vinyl tape.
2. Set the cassette tape in the tape mechanism.Then, stabilize the cassette tape with a weight (500g or less).
   Note: The weight should not be more than 500g.

REMOVAL AND HEIGHT ADJUSTMENT OF REEL DISKS

• Removal of supply reel disk:

1. Remove the cassette housing control assembly.
2. Set the mechanism in the playback mode with no cassette tape in place. Unplug the power cord.
3. Remove the tension band ⑧.
4. Unscrew the screw ⑩ and release the supply reel retainer ass'y ⑫ off the reel disk catch ① .
5. Release the supply reel disk catch ① and back tension lever ②. Pull out the supply reel disk ③ upward.

• Removal of take-up reel disk:

1. Remove the cassette housing control assembly.
2. Set the mechanism in the playback mode with no cassette tape in place. Unplug the power cord.
3. Unscrew the screw ⑪ and release the take-up reel retainer ⑬ off the reel disk catch ⑤ .
4. Release the take-up reel disk catch ⑤. Pull out the take-up reel disk ④ upward.

Notes:

1. After replacing either of the reel disks, be sure to perform the height adjustment procedure.
2. Take care not to deform the tension hand.
3. Be careful not to deform the back tension lever, main supply / take - up brake levers, video search brake lever and auxiliary fast forward brake. (See page 8 and 9.)

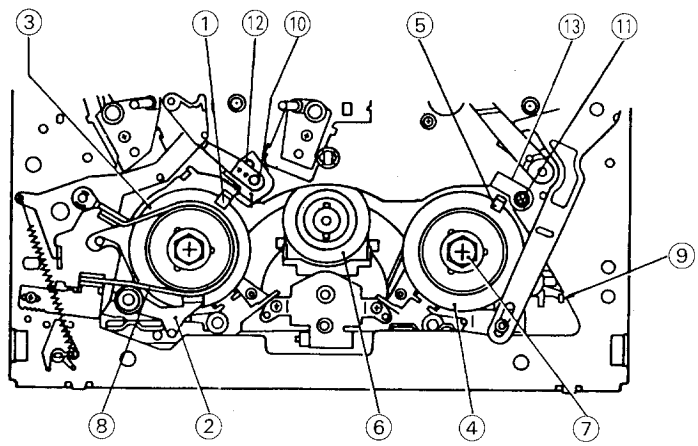


Figure 1-8.

4. Check the tension pole position. (See page 21.)
5. Be careful not to damage the supply reel disk, take-up reel disk and idler gear ⑥.
6. Whenever replacing, clean and lubricate the reel disk shaft.

• Reassembly of supply reel disk:

1. Clean the reel disk shaft and apply oil (high quality spindle oil) to it, then install a new supply reel disk onto the shaft.
2. Replace the supply reel retainer ass'y ⑫ in position and tighten up the screw ⑩ .
3. Replace the tension band ⑧.
4. Adjust the reel disk height by using the master plane and reel disk height adjusting jig.

• Reassembly of take-up reel disk:

1. Clean the reel disk shaft and apply oil (high quality spindle oil) to it. Then, release the video search brake lever and install a new take - up reel disk onto the shaft.
2. Replace the take-up reel retainer ⑬ in position and tighten up the screw ⑪ .
3. Adjust the reel disk height by using the master plane and reel disk height adjusting jig.

Notes:

1. During removal and reassembly, be careful not to damage the reel disks, reel shafts, idler gear and brake levers.
2. After reassembly, check the back tension in video search rewind mode (see page 20) and checking the brake torque (see page 22)

① Supply reel disk catch
② Back tension lever
③ Supply reel disk
④ Take up reel disk
⑤ Take up reel disk catch
⑥ Idler gear
⑦ Height adjusing screw
⑧ Tension band
⑨ Picture scan brake lever
⑩ Screw
⑪ Screw
⑫ Supply reel retainer ass'y
⑬ Take-up reel retainer

HEIGHT ADJUSTMENT

1. Remove the cassette housing assembly, and place the master plane onto the mechanism unit as shown in Fig.1-9 (a), taking care not to hit the drum.
2. Ensure that the reel disk is lower than the part Ⓐ but higher than the part Ⓑ of Fig. 1-9 (b), by using the reel disk height adjusting jig. If the height is not correct, adjust the height adjusting screw.

Note: Whenever replacing the reel disk, perform the height adjustment.

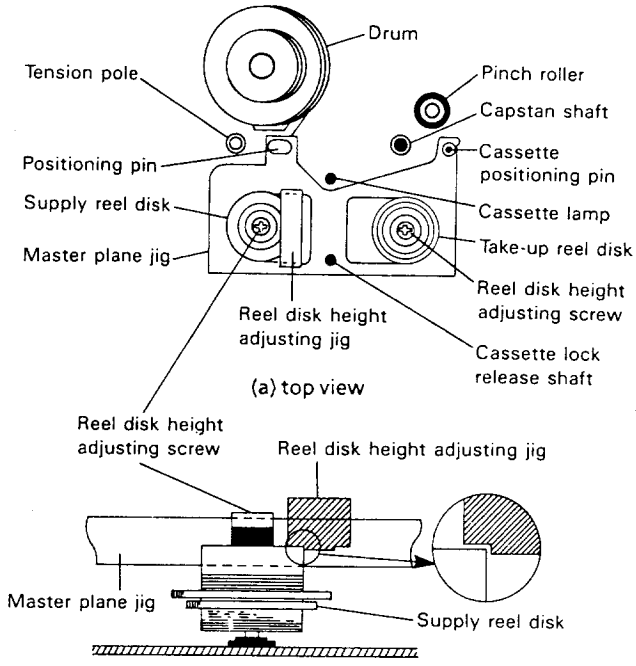


Figure 1-9.

CHECKING THE TAKE-UP TORQUE IN FAST-FORWARD MODE

Notes:

1. When setting the torque gauge on the take-up reel disk and pushing the fast-forward button to start the reel disk turning, take care that the torque gauge does not fly off.
2. The checking and adjustment should be carried out without a video cassette tape in place.

- Checking

1. Remove the cassette housing assembly.
2. Place the torque gauge on the take-up reel disk and push the fast-forward button to place the unit in the fast-forward mode.
3. Turn the torque gauge slowly (one rotation every 2 to 3 seconds) by hand in the take-up direction and check that it indicates 700 g.cm or more.

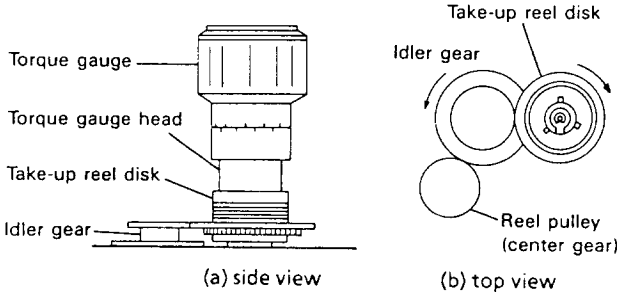


Figure 1-10.

- **Note:**
  If the take-up torque is out of the specified value, clean the capstan D.D. motor pulley, reel belt and reel pulley with cleaning liquid, then recheck the torque.
  If the take-up torque is still out of specification, replace the reel belt.

CHECKING THE TAKE-UP TORQUE IN REWIND MODE

Notes:

1. When setting the torque gauge on the supply reel disk and pushing the rewind button to start the reel disk turning, take care that the torque gauge does not fly off.
2. When checking the take-up torque, do not keep the reel disk locked for a longer time.

- Checking

1. Remove the cassette housing assembly.
2. Place the torque gauge on the supply reel disk and push the rewind button to place the unit in the rewind mode.
3. Turn the torque gauge slowly (one rotation every 2 to 3 seconds) by hand in the take-up direction and check that in indicates 700 g.cm or more.

- **Note**
  If the take-up torque is out of the specified value clean the capstan DD motor pulley, reel belt and reel pulley with cleaning liquid, then recheck the torque.
  If the take-up torque is still out of specification, replace the reel belt.

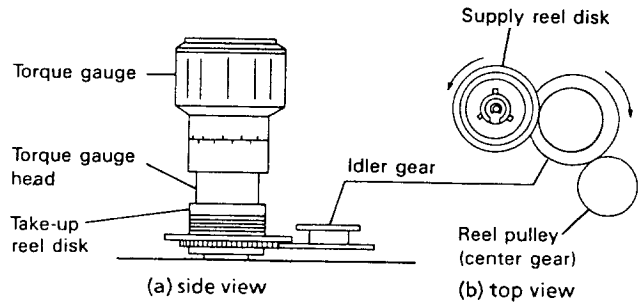


Figure 1-11

CHECKING THE TAKE-UP TORQUE IN PLAY-BACK MODE

- Checking
  Load a cassette torque meter (JiGVHT-063) into the unit and push the record button to place the unit in the record mode. Then check that the torque is as specified;
  torque: EP 95 ± 30 g.cm

Note:
The measured torque fluctuates due to the rotational deviation of the reel drive unit. Use the center of the fluctuating range as the measured value.

1. If the take-up torque in playback mode is out of the specified value, replace the take-up reel disk.
2. Push the EP record button to place the unit in the EP record mode, and check that the take-up torque is within the specified range.

CHECKING THE TAKE-UP TORQUE IN VIDEO SEARCH REWIND MODE

- Checking

Load a cassette torque meter (JiGVHT-063) into the unit and push the play and video search rewind buttons to place unit in the video search rewind mode.
Then check that the torque is as specified;
torque in video search rewind mode : 170 ± 40 g.cm

Note:
The measured torque fluctuates due to the rotational deviation of the supply reel disk. Use the center of the fluctuating range as the measured value.

1. If the take-up torque in video search rewind mode is outside the specified range, replace the supply reel disk.

CHECKING THE FAST FORWARD BACK TENSION

Note:
Set the torque gauge securely on the supply reel disk; if the torque gauge is loose above the reel disk, an inaccurate measurement will result.

- Checking

1. Remove the cassette housing assembly.
2. Push the fast forward button to place the unit in the fast forward mode.
3. Place the torque gauge on the supply reel disk, and turn it clockwise very slowly (one rotation every 2 to 3 seconds) and check that the torque is within 15 ± 5 g.cm.

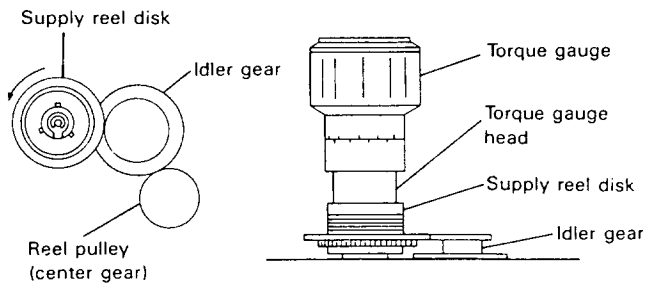


Figure 1-12.

CHECKING THE REWIND BACK TENSION

Note:
Set the torque gauge securely on the take-up reel disk; if the torque gauge is loose above the reel disk, an inaccurate measurement will result.

- Checking

1. Remove the cassette housing assembly.
2. Push the rewind button to place the unit in the rewind mode.
3. Place the torque gauge on the take-up reel disk, and turn it counterclockwise very slowly (one rotation every 2 to 3 seconds) and check that the torque is within 15 ± 5 g.cm.

CHECKING THE VIDEO SEARCH REWIND BACK TENSION

Note:
Set the torque gauge securely on the take-up reel disk; if the torque gauge is loose above the reel disk, an inaccurate measurement will result.

- Checking

1. Remove the cassette housing assembly.
2. Push the play button to place the unit in the playback mode.
3. Push the video search rewind button to place the unit in the video search rewind mode.
4. Place the torque gauge on the take-up reel disk, and turn it counterclockwise very slowly (one rotation every 2 to 3 seconds) and check that the torque is within 40 ± 10 g.cm.

CHECKING THE PINCH ROLLER PRESSURE

1. Remove the cassette housing assembly.
2. Push the play button to place the unit in the playback mode.
3. Hook the tension gauge adapter around the pinch roller shaft.
4. Using a tension gauge, pull the pinch roller in the direction of arrow ⇒ Ⓐ so that the pinch roller moves away from the capstan shaft.
5. Gradually release the pressure in the direction of arrow⇒ Ⓑ to allow the pinch roller to touch the capstan shaft. When the pinch roller just touches the capstan shaft, read the indication on the gauge.
6. Check that the reading of the tension gauge is in the range of 1000 to 1200 gr.

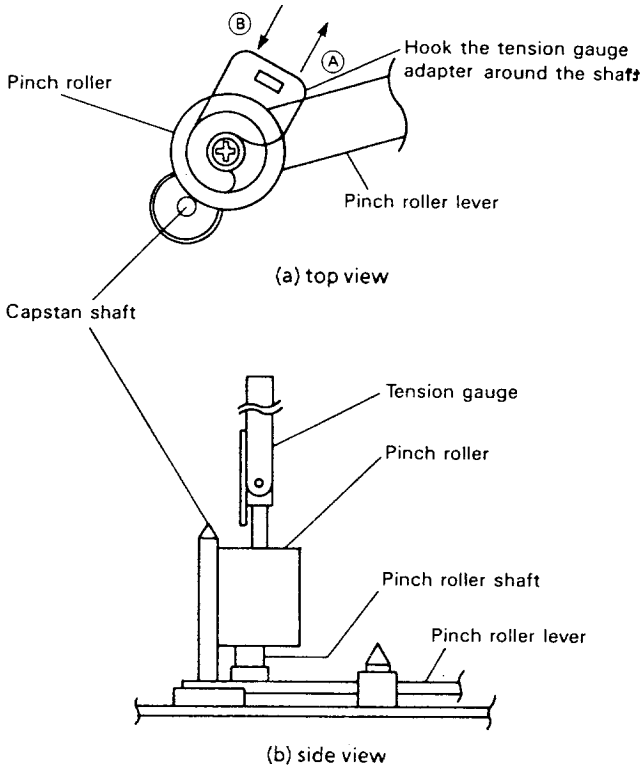


Figure 1-13.

ADJUSTMENT OF THE TENSION POLE

- **Position checking (Fig. 1-14)**

1. Remove the cassette housing assembly.
2. Set a video cassette tape and push the record button to place the unit in the record mode.
3. The pole bases (see page 8; item 19 and 27.) operate to bring the tape outside the cassette housing and simultaneously the tension pole moves to the left, loading the tape. At that time (loading mode), check the position of the tension pole.

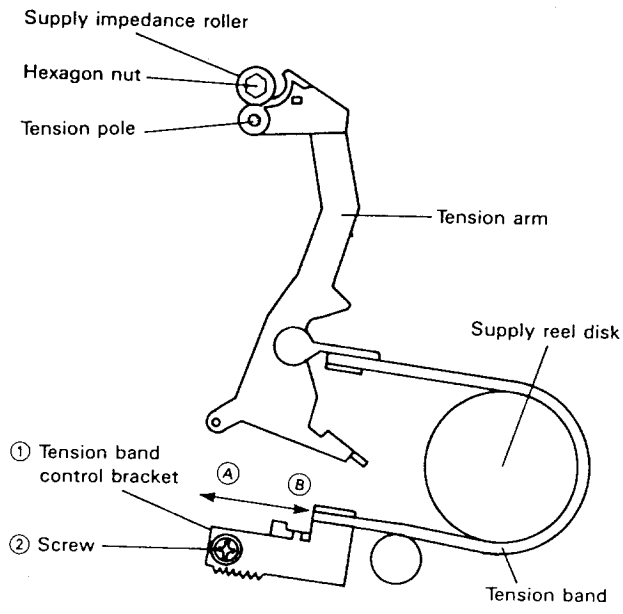


Figure 1-14.

4. At the end of the tape (T-120), check that the tension pole's center is aligned with the supply impedance roller's center.
5. Check that the tape is neither curled against the flange of the supply impedance roller nor mounted over it.
6. During the video search rewind mode with no cassette tape in place, check the supply reel disk is free of the tension band.

- **Position adjustment (Fig. 1-15)**

1. If the tension pole is at the right of the supply impedance roller's center, shift the tension band control bracket ① in the direction of arrow ⇒ Ⓑ , and tighten the screw ②.
2. If the tension pole is at the left of the supply impedance roller's center, shift the tension band control bracket ① in the direction of arrow ⇒ Ⓐ , and tighten the screw ② .

ADJUSTMENT OF THE RECORD/PLAYBACK BACK TENSION

(1) When using a torque cassette meter:

- **Checking**

1. Remove the cassette housing assembly.
2. Put a torque cassette meter into the unit.
3. Push the record button to place the unit in the record mode. Check that the reading of the cassette meter is 23 to 28 g.cm.
4. Make sure the video cassette tape is wound over the retaining guide.
5. Make sure that the tape is not slack nor damaged at both ends.

- **Adjustment (Fig. 1-15)**

1. If the back tension is lower than specified, move the tension spring hook plate ① in the direction of arrow Ⓐ so that the protuberance behind be tight in the hole.
2. If the back tension is higher than specified, move the tension spring hook plate ① in the direction of arrow Ⓑ so that the protuberance behind be tight in the hole.

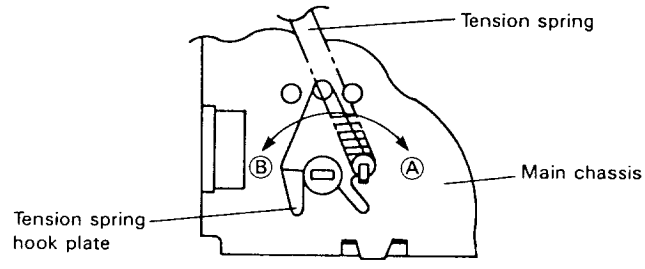


Figure 1-15.

(2) When using a tape tension gauge:

- Checking

1. Remove the cassette housing assembly.
2. Put a video cassette tape (T-120) into the unit.
3. Push the record button to place the unit in the record mode.
4. Place a tape tension gauge as shown in Figs. 1-16 (a) and 1-16 (b) and at the beginning of the tape, check that the tape tension indicated by the gauge is 23 to 28 g.cm.

- Adjustment

1. If the back tension is lower than specified,move the tension spring hook plate ① in the direction of arrow Ⓐ so that the protuberance behind be tight in the hole.
2. If the back tension is higher than specified,move the tension spring hook plate ① in the direction of arrow Ⓑ so that the protuberance behind be tight in the hole.

Notes:

1. Be careful not to allow the tape tension gauge to touch the full erase head or drum.
2. Check that there are no damage and dust on the video cassette tape.

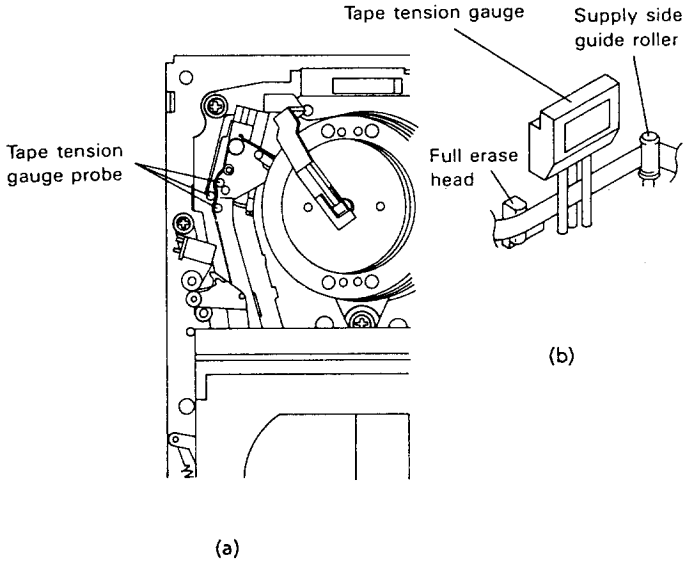


Figure 1-16.

CHECKING THE BRAKE TORQUE

A) Checking the brake torque at the supply side.

- Checking

1. Remove the cassette housing assembly.
2. Check that the mechanism is in the stop mode.
   Note: The stop mode is brought about by unplugging the power cord with the mechanism in the fast forward or rewind mode.
3. Separate the idler gear from the supply reel disk and place the torque gauge on the supply reel disk.
4. Slowly rotate the torque gauge in the clockwise (CW) direction of the supply brake so that the reel disk and the gauge needle rotate at the same speed. Do the same in the counterclockwise (CCW) direction of the supply brake. Check that the values are within the specified range (CW direction = 280 to 720 g.cm, CCW direction = 110 to 230 g.cm) and that the brake torque in the CW direction is at least twice as high as that in the CCW direction.

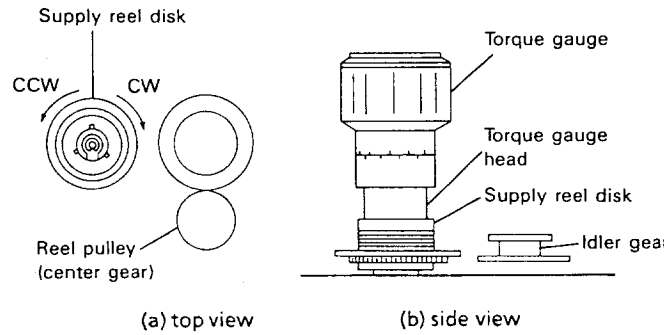


Figure 1-17.

- Note:

1. If the supply brake torque is out of the specified range (CW direction = 280 to 720 g.cm, CCW direction = 90 to 200 g.cm), clean the supply reel disk and brake lever felt, then recheck the torque.
2. If the supply brake torque is still outside the specified range, replace the main brake spring.

B) Checking the brake torque at the take-up side.

- Checking

1. Remove the cassette housing assembly.
2. Check that the mechanism is in the stop mode.
   Note: The stop mode is brought about by unplugging the power cord with the mechanism in the fast forward to rewind mode.
3. Separate the idler gear from the take-up reel disk and place the torque gauge on the take-up reel disk.

4. Slowly rotate the torque gauge in the CCW direction of the take-up brake so that the reel disk and the gauge needle rotate at the same speed. Do the same in the CW direction of the take-up brake. Check that the values are within the specified range (CCW direction = 280 to 720 g.cm, CW direciton = 90 to 200 g.cm) and that the brake torque in the CCW direction is at least twice as high as that in the CW direction.

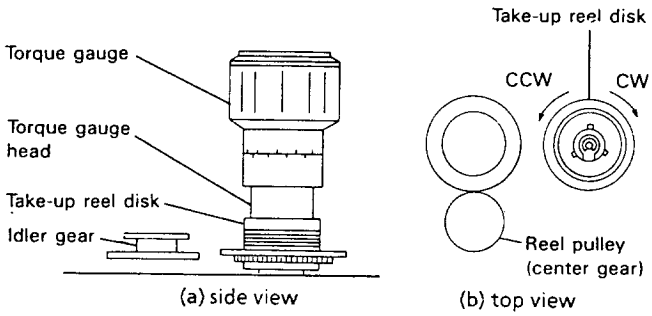


Figure 1-18.

- **Note:**

1. If the take-up brake torque is out of the specified range (CCW direction = 280 to 720 g.cm, CW direction = 90 to 200 g.cm), clean the take-up reel disk and brake lever felt, then recheck the torque.
2. If the take-up brake torque is still out of the specified range, replace the main brake spring.

REPLACEMENT OF A/C (Audio/Control) HEAD

Note:

After replacement, perform the adjustment of tape drive train. Under any circumstances avoid touching the head (indicated by"⇒" in Fig. 1-20(c)).

•Replacement (See Figs. 1-19 and 1-20.)

1. Loosen the tilt adjusting screw ⑥ by using a Phillips screwdriver.
2. Remove the azimuth adjusting screw ⑤ with a Phillips screwdriver.
3. Remove the A/C head screw ④ with a Phillips screwdriver, paying attention to the spring ⑦ between the A/C head screw ④ and A/C head pedestal.

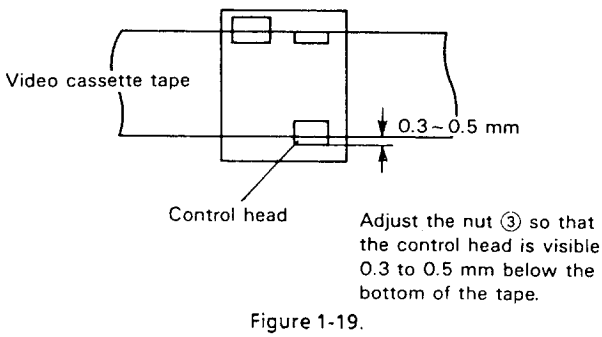
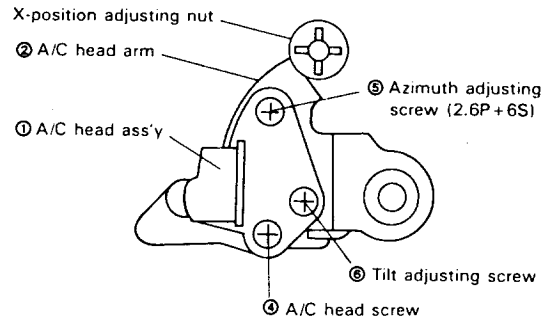
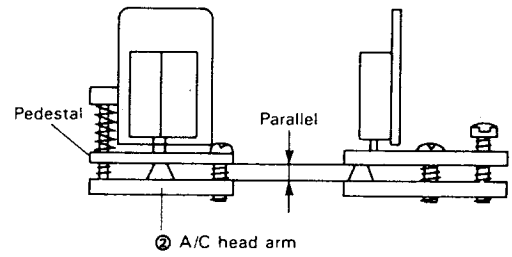

Video cassette tape
0.3~0.5 mm
Control head
Adjust the nut ③ so that the control head is visible 0.3 to 0.5 mm below the bottom of the tape.

Figure 1-19.

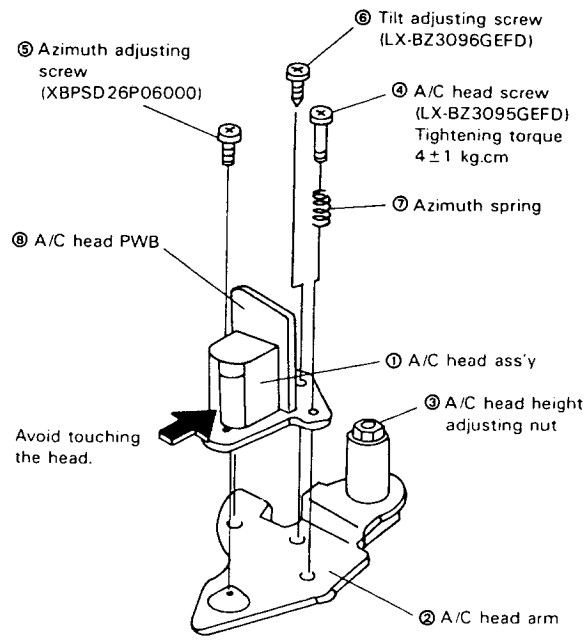
4. Remove the A/C head PWB ⑧ soldered to the A/C head assembly, and solder the A/C head PWB ⑧ onto a new A/C head assembly.
5. The A/C head assembly ① is attached so that the A/C head arm ② and A/C head pedestal are roughly parallel to each other.


X-position adjusting nut
② A/C head arm
⑤ Azimuth adjusting screw (2.6P+6S)
① A/C head ass'y
⑥ Tilt adjusting screw
④ A/C head screw

(a)



(b)


⑤ Azimuth adjusting screw (XBPSD26P06000)
⑥ Tilt adjusting screw (LX-BZ3096GEFD)
④ A/C head screw (LX-BZ3095GEFD) Tightening torque 4±1 kg.cm
⑦ Azimuth spring
⑧ A/C head PWB
① A/C head ass'y
③ A/C head height adjusting nut
Avoid touching the head.
② A/C head arm

(c)

Figure 1-20.

6. Set the A/C head tilt angle according to Fig. 1-22.
7. Play an alignment tape and roughly adjust the height of the A/C head, visually, by turning the A/C head adjusting hexagon nut ③ with the box driver (JiGDRiVER110-7) until the tape comes to the position shown below. (See Fig. 1-19.)
8. Set the mechanism to the loading mode. Place the A/C head tilt adjusting jig on the main chassis as shown in Fig. 1-21. Slowly turn the tilt adjusting screw ⑥ with a Phillips screwdriver until there is no gap between the jig and the A/C head.

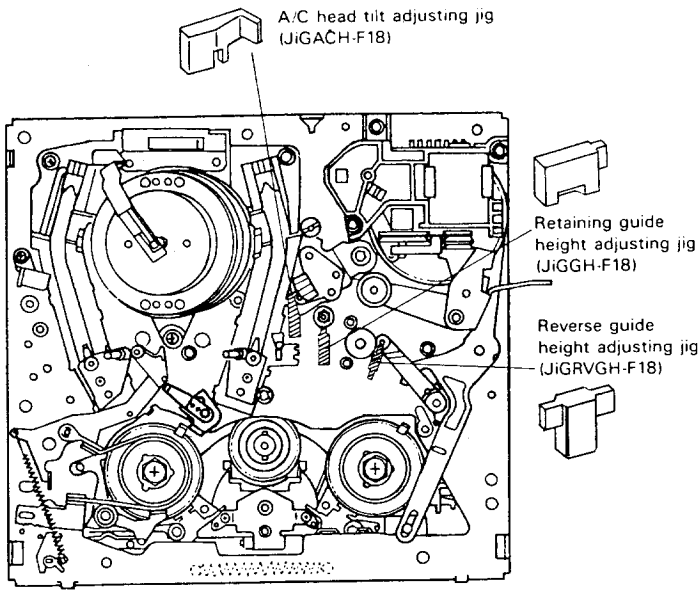


Figure 1-21.

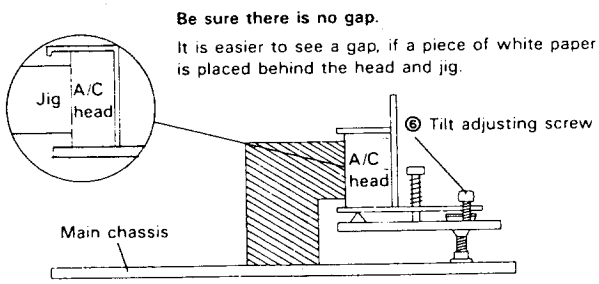

Be sure there is no gap.
It is easier to see a gap, if a piece of white paper is placed behind the head and jig.
Jig
A/C head
⑥ Tilt adjusting screw
A/C head
Main chassis

Figure 1-22.

HEIGHT ADJUSTMENT OF THE RETAINING AND REVERSE GUIDES

- Adjustment

1. Before the rough adjustment of tape drive train, check that the retaining guide and reverse guide heights are within the specified values of Fig. 1-23, by using the special jigs.
2. If the retaining guide height is not correct,adjust the height with the box driver (JiGDRiVER110-4).
3. If the reverse guide height is not correct, use the height adjusting washers.

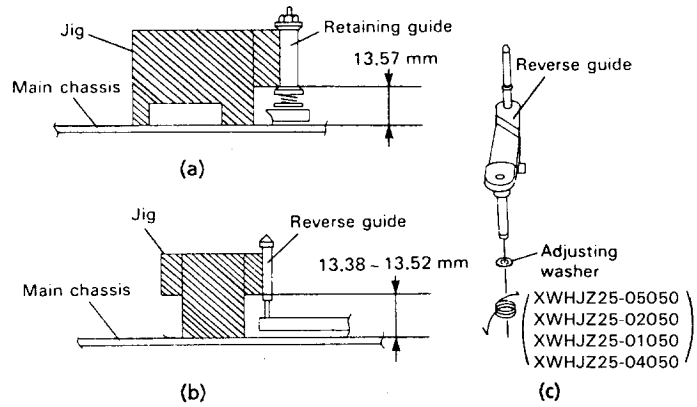


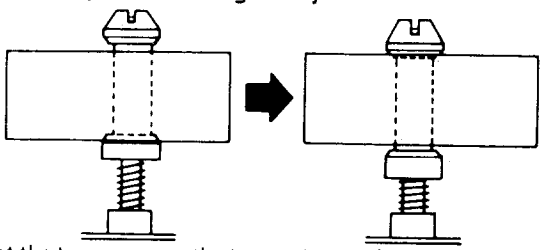
Figure 1-23.

ADJUSTMENT OF THE TAPE DRIVE TRAIN

1. Check and adjust the position of the tension pole and the back tension.(See pages 21 and 22)
2. Set the tilt angle of the A/C head as shown in Fig. 1-22.
   Note:
   If the A/C head is adjusted, check and set the tilt angle as in the case of replacement.
3. After the above adjustments have been completed, roughly adjust the tape drive train using the alignment tape.
   a. Connect the oscilloscope to the test points for PB chroma output (TP501) and head switching pulse (TP502). Allow the PB CHROMA signal to be triggered by the head switching pulse of TP502.
   b. Loosen the setscrew of the guide roller, and tighten it loosely by using the special bladed screwdriver (JiGDRiVERH-4) to such an extent that the guide roller turns smoothly.
   c. Set the alignment tape (VROLBZUS) on the reel disk.
   Note:
   Place approximately 400 to 500g of weight on top of the cassette when the cassette is placed on the reel disk with the cassette housing assembly removed.

d. Place the unit to the playback mode.
e. Observe the waveform of the PB CHROMA, and push the (+)or(-) tracking button to check for a flat PB CHROMA This adjustment is satisfactory if a flat response is obtained on the waveform of the PB CHROMA when the (+)or(-) tracking button is pushed. If a flat response cannot be obtained roughly adjust the guide roller using the special bladed screwdriver until the PB CHROMA output is flat.
While keeping the both(+)and(-) tracking buttons down, adjust the X-position adjusting nut so that the PB CHROMA envelope becomes almost maximum. In the case of rough adjustment, pay particular attention to the outlet side (see Fig. 1-25.(a)).
f. Adjust the retaining guide height so that the lower flange of the retaining guide touches the bottom edge of the tape. At that time, check that the tape is not curled nor wrinkled.

4. Adjust the guide flange height with the tape being traveled.
a. Play back a rough adjustment tape (30 - or 60 - minute tape). Bring the tape into contact with the lower flange of the guide, as shown in Fig. 1-8, for the height adjustment.

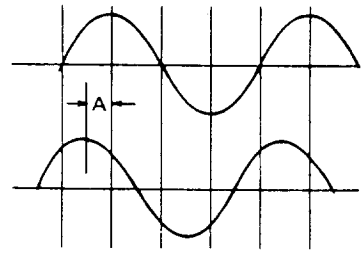


Let the tape run over the taper of the lower flange so as to make acurl.

Lower the retaining guide until there is no tape curl any more.
Now regulate the tape runnin with the lower flange.

Figure 1-24 (a).

b. Play back alignment tape VROLBZUS. Pick up the CH1 and CH2 outputs from the Audio terminal to observe their waveforms.
c. Turn the azimuth adjusting screw ⑤ (Fig. 1-20.(a) so that the output levels of both channels should be neary maximum.
d. Now adjust the A/C head height adjusting nut to obtain maximum audio output level.
e. Then readjust the azimuth adjusting screw to make the output levels of both channels come to maximum.
f. At this stage, check the audio phase to see if it is as specified.



A: AUDIO PHASE

Figure 1-24 (b).

1) Make sure the audio phase is less than 90°.
2) If the phase exceeds 90°, readjust it to below 90° in the direction in which the audio output does not extremely turn down.

5. The final adjustments of tape drive train and X-position are adjusted after adjustment of the A/C head has been completed.
a. Connect the oscilloscope to the test points for PB CHROMA output (TP501) and head switching pulse (TP502). Allow the PB CHROMA signal to be triggered by the head switching pulse of TP502.
b. Play back the tape drive train alignment tape (VROLBZUS).
c. Finely adjust the guide roller's height, observing the envelope on the oscilloscope. Push the (+) or (-) tracking button while adjusting the guide roller, in order to obtain an envelope waveform which is as flat as possible. If the tape is above or below the helical lead, the PB CHROMA waveform will take the shape shown in Fig. 1-26.

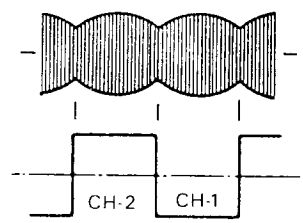


Figure 1-25 (a).

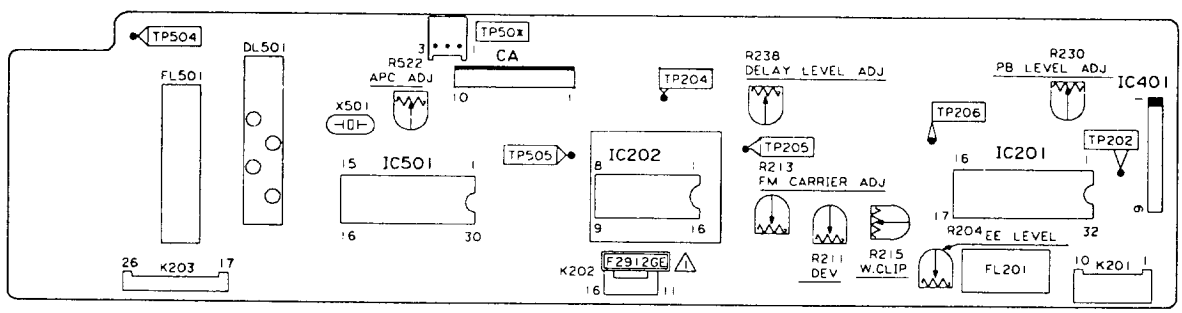


Figure 1-25 (b).

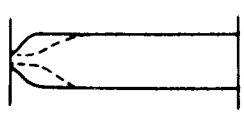
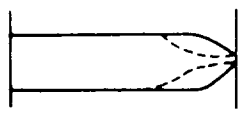
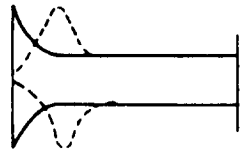
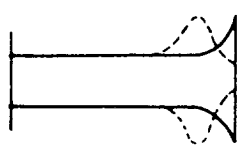
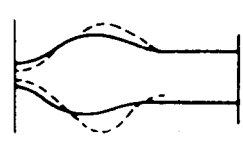
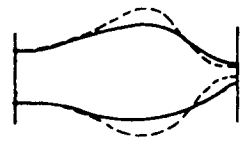
	When the tape is above the helical lead.		When the tape is below the helical lead.	
	Supply side	Take-up side	Supply side	Take-up side
				
				
Adjustment	Supply side guide roller rotated in clockwise direction (lowers guide roller) to flatten envelope.	Take-up side guide roller rotated in clockwise direction (lowers guide roller) to flatten envelope.	Supply side guide roller rotated in counterclokwise direction (raises guide roller) to have the tape float above the helical lead. The supply side guide roller is then rotated in the clockwise direction to flatten the envelope.	Take-up side guide roller rotated in counterclockwise direction (raises guide roller) to have the tape float above the helical lead. The take-up side guide roller is then rotated in the clockwise direction to flatten the envelope.

Figure 1-26.

Adjust for maximum flatness of the envelope according to the figure.

Note:

Adjustment is made for CH-1 of switching pulse (low level). The broken lines indicate the envelope waveform when the tape does not run properly.

Push the (+) or (-) tracking button to check the envelope waveform.

After adjustment, tighten the setscrew of the guide roller firmly.

Play back the alignment tape (VROLBZUS) again in the unloading mode, and make sure that there is on change in the PB CHROMA output.

d. Adjust the retaining guide height so that the lower flange of the retaining guide touches the bottom edge of the tape. At that time, check that the tape is not curled nor wrinkled.

e. The X-position is adjusted after tape drive train adjustment.

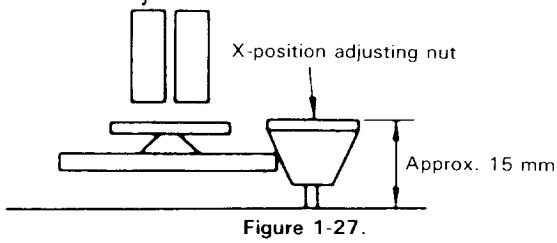


Figure 1-27.

Push the (+) and (-) tracking buttons at the same time to set the tracking buttons to the preset mode, and rotate the X-position adjusting nut shown in Fig. 1-27 with the special bladed screwdriver for maximum switching pulse low side envelope, and then adjust the A/C head position. Now adjust the play back switching point to 6.5 ± 0.5H.

Check the flatness of envelope and sound by selfrecording.

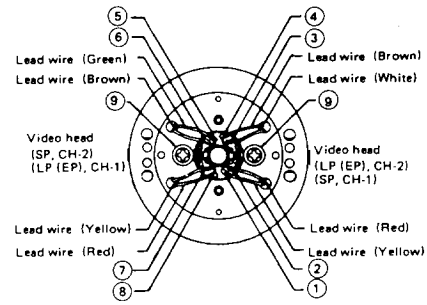
REPLACEMENT OF THE UPPER DRUM

Note:

The engagement between the lower drum (outer diameter) and the upper drum(inner diameter) is very accurate, (in the range of microns) and the replacement should be performed very carefuly. Even a slight entry of foreign material will affect the accuracy of their reassembly.

- **Replacement (See Fig. 1-28)**

1. Unsolder the leads ① to ⑧ from the video head and remove them.
2. Remove the two screws ⑨ (brass screws with washers) using a Phillips screwdriver.



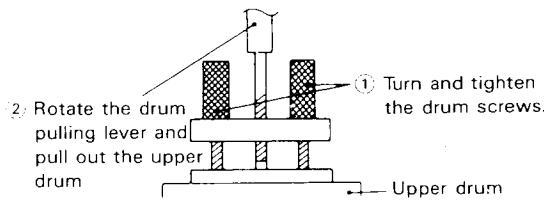


Figure 1-28.

3. Withdraw the upper drum by pulling it up with the upper drum replacement jig.

Notes:

1. Avoid touching the drum surface with bare hands.
2. Do not hit the screws when tightening them.

- **Reassembly**

1. Set a new drum for replacement, as shown in Fig. 1-28, and position the leads properly.

Notes:

1. Before replacing the upper drum, check that there are no scratches or dust on the edge or the outer surface of the lower drum.
2. Before replacing the upper drum, check that there are no scratches or dust on the edge or the inner surface of the upper drum.
3. On assembling these parts, slowly insert the upper drum onto the lower drum with the upmost care, so that the upper drum is not tilted.
4. When assembling these parts, do not allow foreign material to come between them.
5. Do not use excessive force when driving in the screws.

2. Fasten the upper drum in place with the two screws ⑨ .
3. Solder the leads ① to ⑧ at their respective pads.

Note:

Soldering should be performed quickly and carefully without touching adjacent patterns.

4. After replacement, be sure to check the tape drive train adjustment and the following.
   - Adjustment of the head switching point (See page 32).
   - Checking and adjustment of the X-position (See page 26).
   - Adjustment of SP, EP slow tracking preset (See page 32).

REPLACEMENT OF THE D.D. (DIRECT DRIVE) MOTOR

Note:

Put the unit in the cassette eject position.

- **Removal**

1. Remove the six screws from the bottom panel and remove the bottom panel.
2. Disconnect the drum D.D. motor lead connector.
3. Remove the two screws① which hold the D.D. rotor assembly in place, using a Phillips screwdriver.
4. Remove the D.D. rotor assembly.
5. Remove the three screws ② which hold the D.D. stator assembly in place, using a Phillips screwdriver.
6. Remove the D.D. stator assembly.

- **Reassembly**

1. Place the D.D. stator assembly on top of the lower drum.
2. Secure the D.D. stator with the three screws ② using a Phillips screwdriver.

Note:

Be careful not to scratch the core, windings or Hall device.

3. Install the D.D. rotor assembly onto the drum shaft.

Note:

Install the assembly directly onto the direction of the shaft. (Refer to Fig. 1-29 for the installation direction.)

4. Secure the D.D. rotor assembly with the screws ①.
5. Connect the drum D.D. motor lead connector.
6. Install the bottom panel with six screws.

Note:

Be careful not to damage the upper drum or the video heads.

7. **After replacement of the D.D. motor as shown above, proceed with the adjustment of the playback switching point.**

Notes:

1. **Be careful not to damage the upper drum or the video heads.**
2. **Be sure that the Hall device and the D.D. stator assembly are not damaged by the D.D. rotor assembly or other parts.**

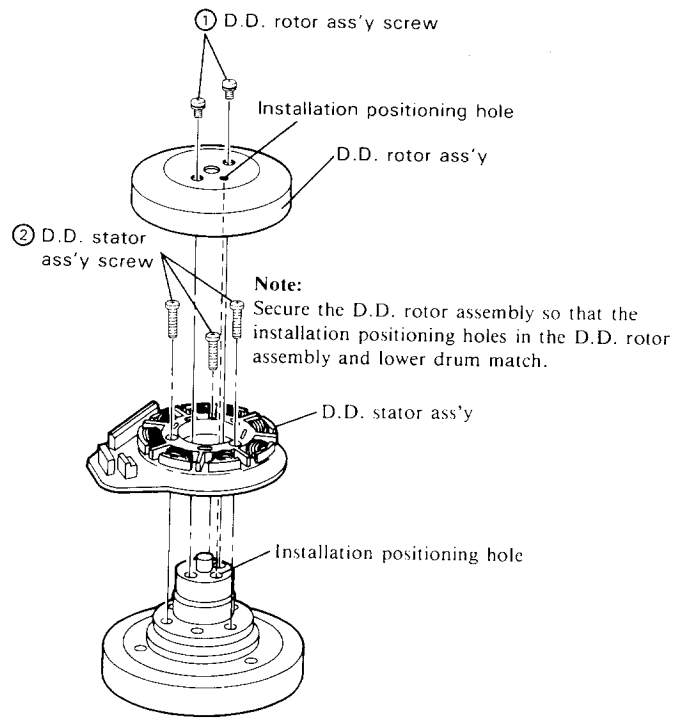

① D.D. rotor ass'y screw
Installation positioning hole
D.D. rotor ass'y
② D.D. stator ass'y screw
Note:
Secure the D.D. rotor assembly so that the installation positioning holes in the D.D. rotor assembly and lower drum match.
D.D. stator ass'y
Installation positioning hole

Figure 1-29.

REPLACEMENT OF THE CAPSTAN D.D. (DIRECT DRIVE) MOTOR

- **Removal**

1. Remove the FFC ① from the capstan D.D. motor control PWB ②.
2. Remove the three screws ③, and remove the capstan D.D. motor ④ from the main chassis.

- **Reassembly**

1. Mount the capstan motor on the main chassis while making sure not to allow the capstan shaft to hit the main chassis, and attach it with the three screws ③.
2. Insert the FFC ① into the capstan D.D. motor control PWB ②.

Notes:

1. After installing the capstan D.D. motor, be sure to rotate the capstan motor and check the movement.
2. Check and adjust the servo circuit.

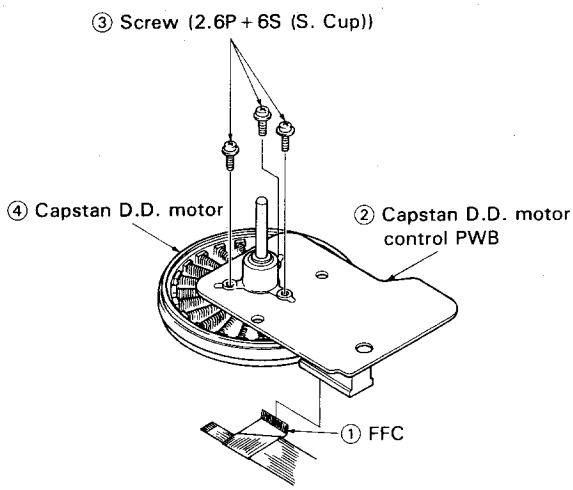


Figure 1-30.

REMOVAL AND REASSEMBLY OF THE LOADING GEAR BLOCK

- **Removal**

1. Remove the slow brake spring ① and slow brake lever ②.
2. Take out the E ring Ⓐ first and then the loading relay gear ③.
3. Rotate the take-up loading gear ④, take-up loading arm assembly ⑤, supply loading gear ⑥ and supply loading arm assembly ⑦ slightly in the loading direction, and take them all out.
4. Finally remove the E ring Ⓑ and relay gear drive lever ⑧.

- **Reassembly**

1. Take the reverse steps of the removal.
2. In reassembling, match the tally marks on the gears, as shown in Fig. 1-31

Note:

1. When reassembling, apply grease to the following points; all the gear teeth, all the gear shafts, and the cam groove of loading relay gear which the relay gear drive lever pin comes in.
2. Be careful not to deform the supply/take-up loading arms.
3. Be careful not to stain the felt of the slow brake.
4. Be also careful to keep the outer surface of the capstan D.D. motor ⑨ free from dust and dirt. (If stained, the MR (Magnet Resistor) element ⑩ might be damaged.)
5. Reshape the anti-fall hooks of the slow brake, supply/take-up loading gears as required. Avoid reshaping too much.

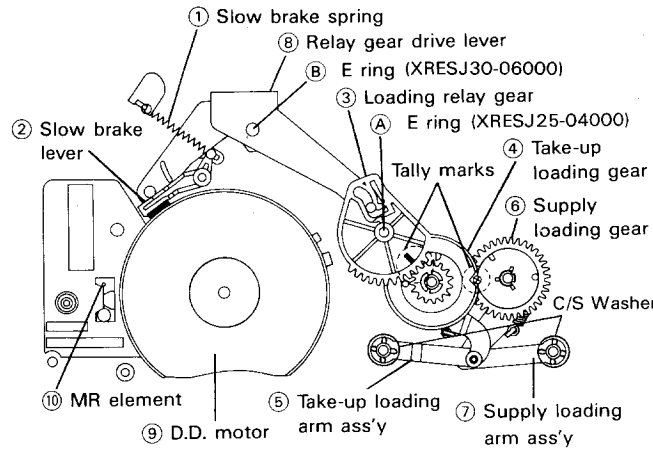


Figure 1-31.

REMOVAL AND REASSEMBLY OF THE LOADING BLOCK

- **Removal**

1. Remove the leads and the cassette loading belt from the loading block.
2. Unscrew the three screws ③, and pull up and remove the loading block.

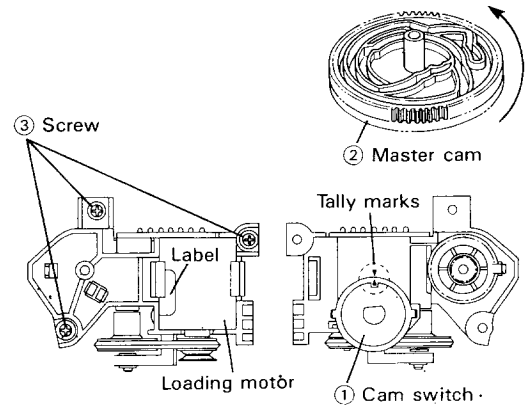


Figure 1-32.

- **Reassembly**

1. Turn the master cam ② all the way counter-clockwise.
2. Match the tally mark on the cam switch ① with the mating mark. Fit the loading block and the master cam with each other. Tighten up the three screws.
3. Finally connect the leads and apply the cassette loading belt.

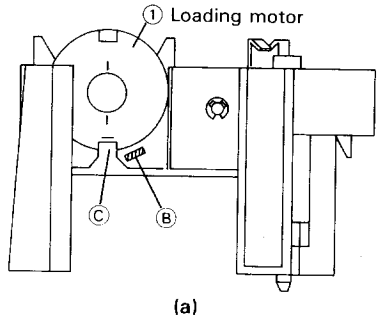
Notes:

1. Be careful not to scratch the gear.
2. Be careful not to stain the belt. If dirty, clean it up.

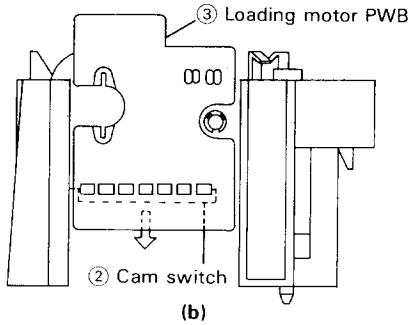
REPLACEMENT OF THE LOADING MOTOR

- **Removal**

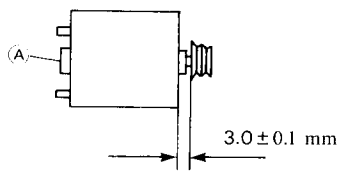
1. Remove the loading block.
2. Undo the loading belt.
3. Unsolder the leads from the loading motor ①.
4. Unlock the left and right catches of the cam switch ② off the loading block. Take out the loading block PWB ③.



(a)



(b)



(c)

Note:

1. Press-fit the loading motor pulley to the dimension specified in Fig. 1-33(c).
2. Keep the pressure on the part Ⓐ (see above) less than 5 kg.

Figure 1-33.

5. Put the tip of a bladed screwdriver or the like into the opening Ⓑ shown in Fig. 1-33 (a). Pry up the back end of the loading motor ① and take out the motor.

- **Reassembly**

1. Place the loading motor so that its label is visible as ahown in Fig. 1-32.
   Note:
   Make sure that the screw hole at the motor shaft and the protuberance on the loading block are properly engaged and that the notch at the loading motor end and the part Ⓒ of the loading block are also fitted together.
2. Set up the loading block PWB ③ and the cam switch ② in position.
3. Resolder the leads to the loading motor.
4. Finally place the loading block in position.

REPLACEMENT OF THE MASTER CAM

- **Removal**

1. Remove the loading block.
2. Remove the E ring Ⓑ first and then the pinch roller lever ②.
3. Finally pull out the master cam ③ upward.

- **Reassembly**

1. Place the relay gear drive lever in the unloading state as shown in Fig. 1-31.
2. Set the relay shifter lever ④ to the main chassis; the shifter lever should be adjusted to the reverse guide spring hole in the main chassis. Then place the master cam so that the cut-off part of the boss Ⓒ should face the direction of arrow ⇒ Ⓐ.

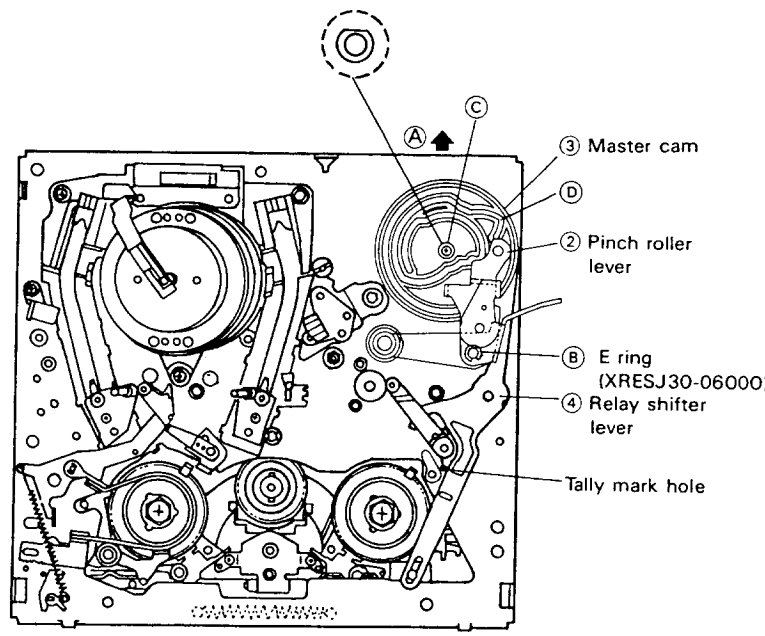


Figure 1-34.

3. Turn the master cam ③ somewhat clockwise until the pinch roller lever's cam follower comes into the master cam's groove Ⓓ. Then attach the E ring Ⓑ.
4. Rotate the master cam ③ by hand to make sure all the three levers (relay gear drive lever, relay shifter lever and pinch roller lever) are right in the cam grooves.
5. Finally set up the loading block.

Notes:

1. Be careful not to scratch the teeth and grooves of the master cam.
2. Before placing the loading block, be sure to rotate the master cam by hand to make sure the levers are right in their respective positions. Otherwise the master cam and the levers might get damaged when the motor starts.
3. Apply grease to the master cam's grooves and teeth.

HOW TO UNLOAD THE CASSETTE MANUALLY

- To unload the cassette the common way.

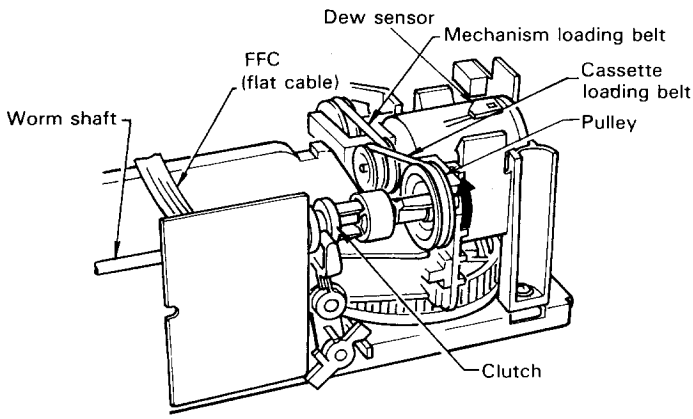


Figure 1-35.

Turn the pulley in the direction of arrow.
(By this, the ciutch becomes engaged to eject the cassette.)

Notes:

1. Do not touch the worm shaft. Just turn the pulley, and the worm shaft will rotate together.
2. Carefully turn the pulley if the unit is equipped with the half-loading lever.
   Otherwise the cassette tape may get loose.

- To unload the cassette by activating the cassette housing control.

1. Remove the cassette loading belt.
2. Turn the coupling in the direction of arrow until the cassette comes up.
3. Press the clutch in the direction A to get the clutch engaged.
4. Now turn the worm shaft all the way in the direction of arrow to take out the cassette.

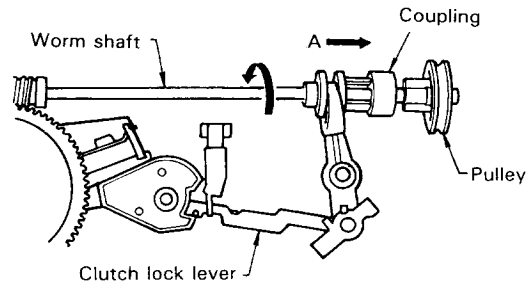


Figure 1-36.

Note:

Carefully turn the worm shaft if the unit is equipped with the half-loading lever.
Otherwise the cassette tape may become loose.

- If the second method (activating the cassette housing control) is carried out, the cassette housing control and the mechanism come out of phase from each other. Take the following steps to get in phase with the cassette housing control.

1. Remove the cassette loading belt and the flat cable.
2. Turn the power on. The mechanism will automatically be in the eject mode and get in phase with the cassette housing control.
3. Unplug the power cord.
4. Make sure the cassette housing stays in the eject mode. Apply the cassette loading belt and connect the flat cable.
5. Plug in the power cord. Finally load the cassette and eject it to make sure the motion is perfect.
   (This loading and ejection makes for proper phasing.)

Notes:

1. If the tape has not been fully rewound, remove the bottom panel of the unit and turn the capstan D.D. motor rotor or the reel pulley in the direction of arrow B to wind up the tape.
   Now you can take out the cassette without damaging the tape.
2. Before taking the above measure, be sure to unplug the power cord.

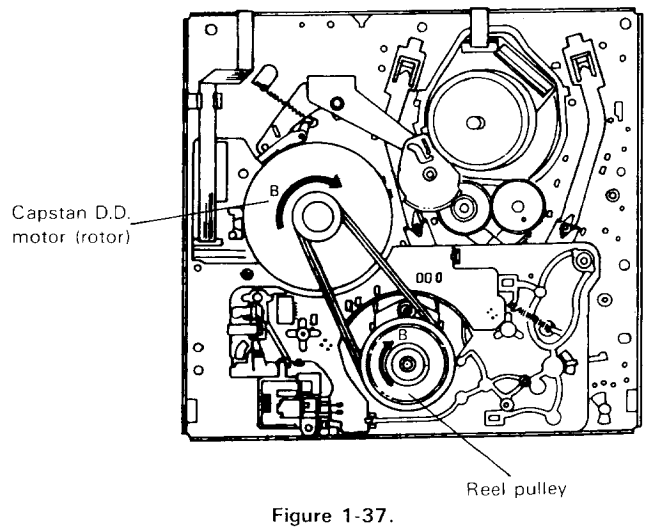


Figure 1-37.

ADJUSTMENT OF THE ELECTRICAL CIRCUITRY

Prior to the adjustment:
Most of the electrical adjustments are required after mechanical parts (video head included) have been replaced. Check that all the mechanical functions are normal before attempting adjustment of the electrical circuits.

Electrical adjustments require proper troubleshooting.
After repair or parts replacement the following alignments may be required.

- **Instruments**
  - Color monitor TV
  - DC regulated power supply
  - Sweep/Marker generator
  - Oscilloscope
  - Audio generator
  - SSVM (Solid state volte meter)
  - Color bar generator
  - Alignment tape
  - Frequency counter
  - Blank video tape(VHS)

ADJUSTMENT OF MAIN (SERVO, SYSTEM CONTROL, TUNER, OSD) CIRCUIT

- **Test points layout**

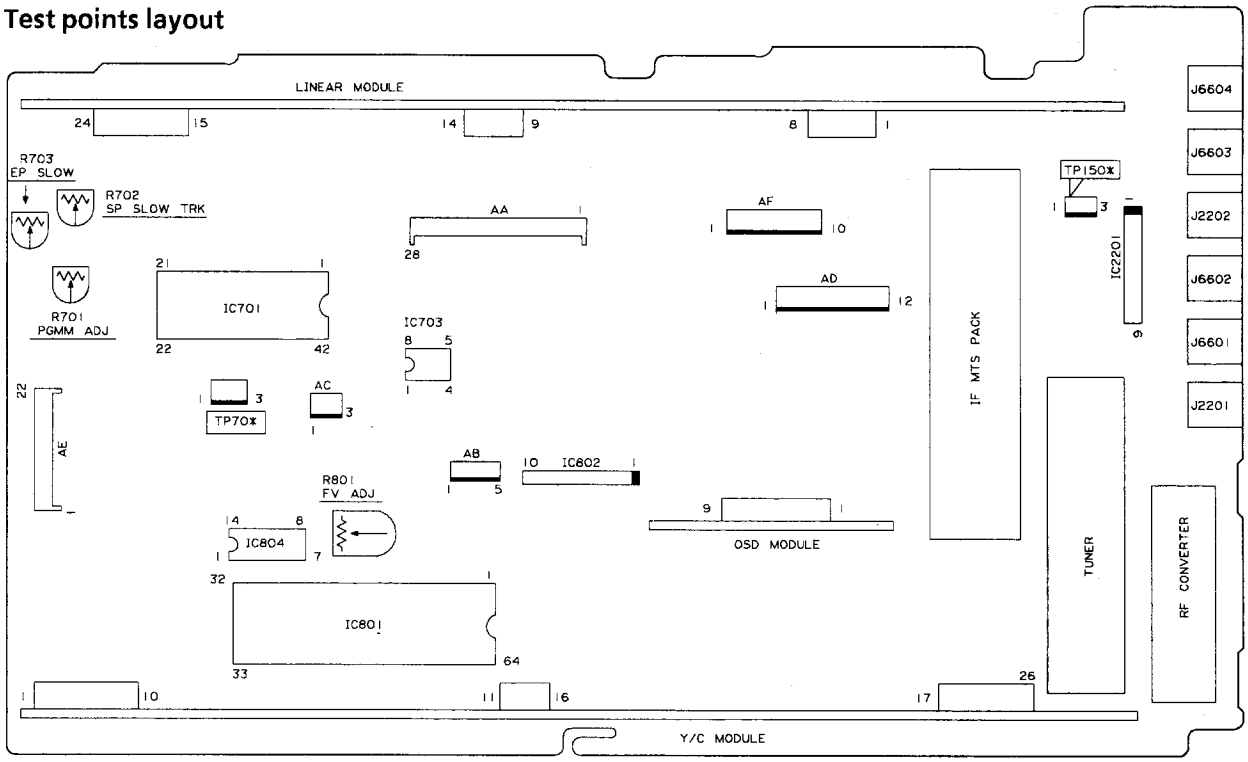


Figure 2-1 (a). MAIN PWB

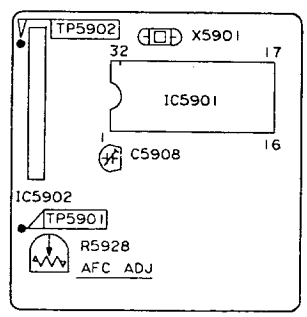


Figure 2-1 (b). OSD PWB

■ ADJUSTMENT OF SERVO CIRCUIT

Adjustment of head switching point

Measuring instrument	Oscilloscope
Mode	Playback Tracking button at center
Tape used	Alignment tape (VROATSV)
Test point	CH-1; TP701 CH-2; Video output Triggered by leading edge of TP701
Control	R701
Specification	6.5 ± 0.5H

1. Insert the alignment tape (VROATSV) and put the unit in playback mode.
2. Set the tracking button to the center position.
3. Adjust R701(phase generator MM control) so that the waveform on the oscilloscope is as shown in Fig. 2-2.

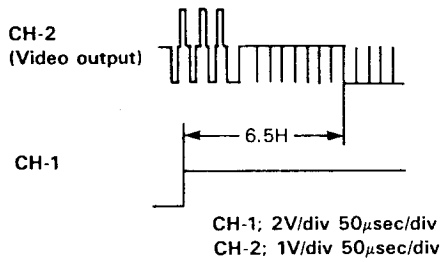


Figure. 2-2.

Adjustment of SP slow tracking preset

Measuring instrument	Monitor TV
Mode	Record in SP mode and play it.
Input signal	TV broadcast or external video input
Test Point	Monitor screen
Control	R702
Specification	Noise-free picture on monitor.

1. Receive a commercial broadcast signal, or feed the video signal to the video input terminal (with the external input selector switch).
2. Record the signal in SP mode in order to make a self-recorded tape and play it.
3. Press the slow button of the remote control.
4. Set the SP slow tracking control in the center.
5. Observing the monitor screen, adjust the SP slow tracking preset control (R702) until the noise bar disappears form the screen.
6. Press the PLAY button to advance the tape and press the PAUSE/STILL button again. Make sure the picture on screen is noise-free.

Adjustment of EP slow tracking preset

Measuring instrument	Monitor TV
Mode	Record in EP mode and play it.
Input signal	Commercial broadcast or video signal (external input selector switch)
Test point	Monitor screen
Control	R703
Specification	No noise bar on the monitor TV screen

Take the same procedure with that for "Adjustement of SP slow tracking preset" except tape speed (EP) and control (R703).

Adjustment of still picture vertical sync (FV)

Measuring instrument	Monitor TV
Mode	Still picture playback
Tape used	Self-recording (SP/EP)tape
Test point	Monitor screen
Control	R801 (False vertical sync)
Specification	No vertical jitter

1. Play back the tape self-recorded in the SP mode.
2. Press the pause/still button to have a still picture.
3. Observing the monitor screen, adjust R801 (still picture vertical sync control) until the vertical jitter disappears form the screen.
4. Then play the tape self-recorded in the EP mode and make sure there is no vertical jitter on the monitor screen.

■ ADJUSTMENT OF ON-SCREEN DISPLAY

Adjustment of AFC

Measuring instrument	Frequency counter
Mode	————
Input signal	————
Test point	TP5901 and TP5902
Control	R5928
Specification	15.734 ± 0.25 kHz

1. Connect the frequency counter to TP5902.
2. Connect TP5901 to pin ⑨ of IC5902 (+ 5V) with a wire. (on-screen-display may disappear)
3. Adjust R5928 (AFC control) so that the counter reading is 15.734 ± 0.25 kHz.
4. Remove the wire connected between TP5901 and pin ⑨ of IC5902.

Checking of AFC

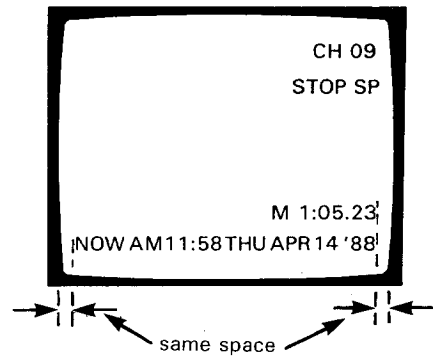
Measuring instrument	Monitor TV
Mode	E-E mode
Input signal	TV broad cast
Test point	Monitor screen
Control	————
Specification	Stable sync of no-screen-display

1. Press the on-screen display button on the infrared remote control to have the no-screen-display on the monitor TV screen.
2. Change the TV channel and make sure that the no-screen-display (superimposed on TV picture) stays in sync and stable.

Adjustment of dot clock

Measuring instrument	Oscilloscope, monitor TV
Mode	————
Input signal	————
Test point	Video output terminal Monitor screen
Control	C5908
Specification	56 $^{+1}_{-2}$ µsec.

1. In the AFC checking discussed above, check to see if the right-hand margin of the counter display on the monitor TV screen is as specified.
2. Observe the video output terminal waveform on the oscilloscope. Make sure that takes 56 $^{+1}_{-2}$ µsec. between the leading edge of the H sync pulse and the final character display on the screen.
   Or adjust C5908 so that the on-screen-display is positioned in the center of screen as shown below.



ADJUSTMENT OF Y/C CIRCUIT

- **Test point layout**

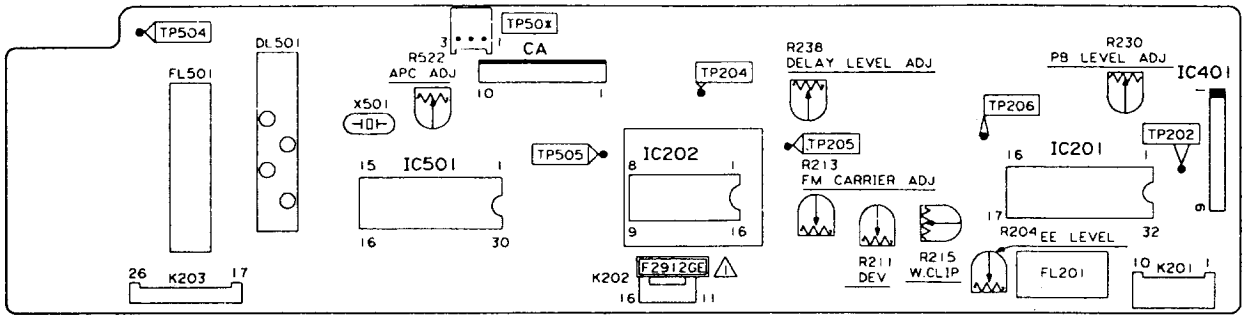


Figure 2-3. Y/C PWB

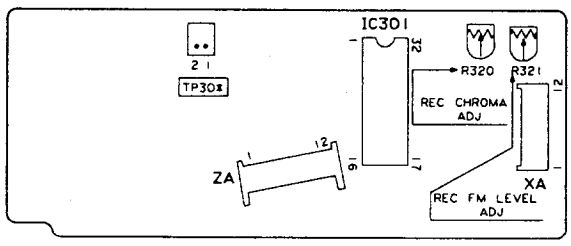


Figure 2-4. HEAD AMP PWB

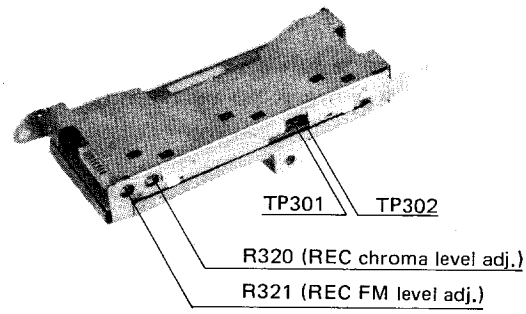


Figure 2-5. HEAD AMP layout

■ ADJUSTMENT OF Y/C RECORDING CIRCUIT

Adjustment of EE level

Measuring instrument	Oscilloscope
Mode	EP recording
Input signal	Standard color bar (stair-case waveform)
Test point	Video out (75 ohm termination)
Control	R204
Specification	1.0 ± 0.05 Vp-p

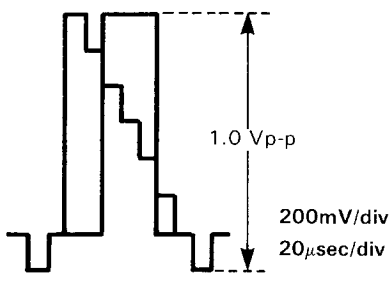


Figure 2-6.

Note:
The video output terminal should be terminated with a 75-ohm impedance other wise the signal amplitude is doubled.

1. Set the unit in EP record mode.
2. Feed the color bar signal(stair-case waveform)to the video input terminal. Observe the signal at the video output terminal and adjust R204 so that the signal amplitude is 1Vp-p as shown in Fig. 2-6.

Adjustment of FM 3.4 MHz and 4.4 MHz

Measuring instrument	Frequency counter	Oscilloscope
Mode	EP recording	EP self-recording / playback
Input signal	External input (no signal)	Standard color bar (stair-case waveform)
Test point	TP204	TP204
Control	R213 (FM carrier control)	R211 (deviation control)
Specification	3.4 MHz ± 50kHz	1.0 ± 0.04 Vp-p

Note:
Carry out this adjustment only when IC201 has been replaced or when the carrier setting (3.4 MHz) or the deviation (4.4 MHz) is found apparently out of specification.

Make this adjusment after the EE level has been completely adjusted.

1. Play the alignment tape and make suve that PB signal at the video output terminal is $1V_{p-p}$ with 75 ohm termination resistor.
2. Set the unit in record mode and select the EXTERNAL input.
   Note:
   Do not connect anything to the external input terminal.
3. Hook up the frequency counter to TP204. Adjust R213 (FM carrier control) so that the counter reads 3.4 MHz ± 50kHz.
4. Feed the color bar signal to the external video input terminal and record it on tape.
5. Rewind the tape and play the color bar recorded in STEP 4.
6. Observe the video signal on the oscilloscope and make sure that the signal amplitude is $1V + 0.05V_{p-p}$
   If the amplitude is out of specified value, adjust R211 (clockwise to increase, counterclock wise to decrease) and repeat from STEP 2 to STEP 6 till the carrier frequency (3.4 MHz) and deviation are both satisfactory.

Adjustment of white clip

Measuring instrument	Oscilloscope
Mode	EP recording
Input signal	Standard color bar (stair-case waveform)
Test point	TP203
Control	R215
Specification	90 ± 4%

1. Set the unit in EP record mode.
2. Feed the color bar (stair-case waveform) signal.
3. Observing the output at TP203, adjust R215 (white clip control) so that the positive overshoot is clipped at 190% as shown in Fig. 2-7.

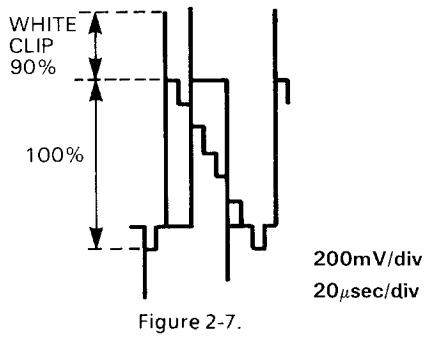


Figure 2-7.

Adjustment of recording current

Measuring instrument	Oscilloscope	
Mode	EP recording	
Input signal	Standard color bar (stair-case waveform)	
Test point	TP301 (GND at TP302) (External triggered on video output terminal)	
Controls	R321 FM rec current	R320 (Rec chroma current)
Specification	120 ± 5mVp-p at Sync tip portion	30 ± 2mVp-p at Red portion

Note:
TP301,TP302, R320 and R321 are located on the head amp PWB.

1. Set the unit in EP record mode.
2. Feed the color bar (stair-case waveform) signal.
3. Observe the waveform on the oscilloscope (external triggered on video output terminal), and take the following steps.
   a) Connect the oscilloscope's GND and SIG leads to TP302 and TP301, respectively.
   b) Turn R321 (FM rec current) to minimum.
   c) Adjust R320 (rec chroma current) so that the red level is 30 ± 2mVp-p as shown in Fig.2-8.
   d) Disconnect the capacitor that was connected in Step c).
4. Adjust R321 (FM rec current) so that the sync tip is 120 ± 5mVp-p as shown in Fig.2-9.

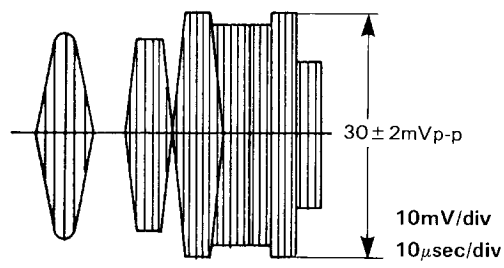


Figure 2-8.

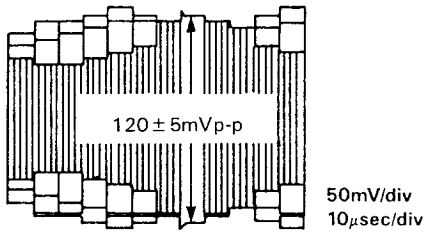


Figure.2-9.

■ ADJUSTMENT OF THE Y/C PLAYBACK CIRCUIT

Adjustment of playback video signal level

Measuring instrument	Oscilloscope
Mode	Playback
Tape used	Alignment tape (stair-case waveform)
Test point	Video out (75 ohm termination)
Control	R230
Specification	1.0 ± 0.05Vp-p

Note:
The video output terminal should be terminated with a 75-ohm impedance.

1. Insert the alignment tape (stair-case waveform) and set the unit in playback mode.
2. Hook up the oscilloscope to Video out. Adjust R230 (playback level control) so that the signal amplitude is 1.0 ± 0.05Vp-p.

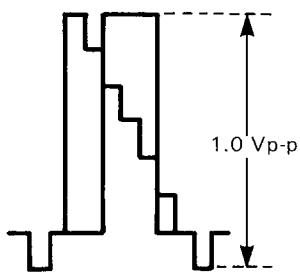


Figure 2-10.

Adjustment of delay level

Measuring instrument	Dual-beam oscilloscope
Mode	Playback
Tape used	Alignment tape (color bar signal)
Test point	CH-1; TP205 CH-2; TP206
Control	R238
Specification	CH-2 level = CH-1 level

1. Insert the alignment tape (color bar signal) and play it.
2. Adjust R238 (delay level control) so that the levels for CH-1 and CH-2 are the same as shown in Fig. 2-11.

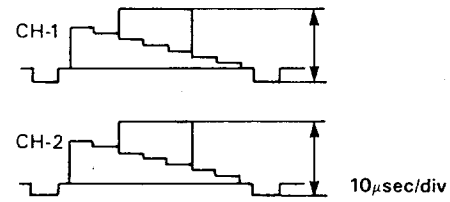


Figure 2-11.

Adjustment of the APC

Measuring instrument	Frequency counter
Mode	Playback
Tape used	Alignment tape (VROATSV)
Test point	TP504
Control	R522
Specification	3.579545MHz ± 10Hz

1. Play the alignment tape (VROATSV).
2. Connect the frequency counter to TP504. Adjust R522 (APC control) so that the counter reads 3.579545MHz ± 10Hz.

■ ADJUSTMENT OF THE AUDIO CIRCUIT
(The items in brackets [ ] refer to R-CH parts.)

- **Test point layout**

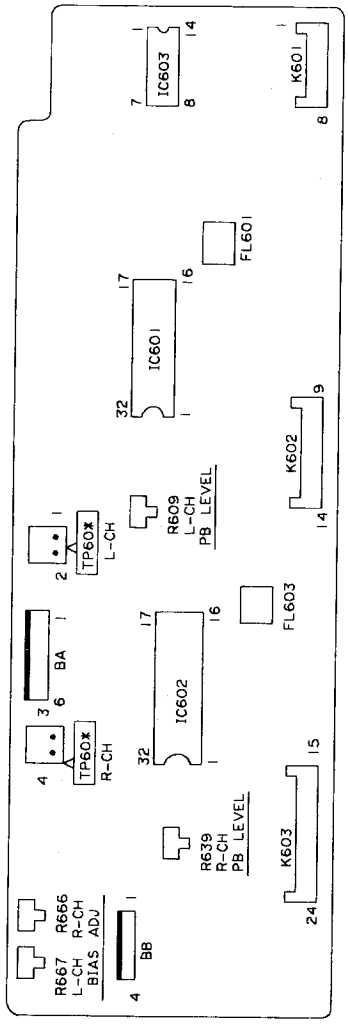


Figure 2-12. AUDIO PWB

Adjustment of playback level

Measuring instrument	SSVM
Mode	Playback
Tape	Alignment tape (VROATSV) (1-kHz level control signal)
Test point	Audio output terminal
Control	R609 [R639]
Specification	-8 ± 0.5dBm

1. Play the alignment tape (1-kHz level control signal).
   Connect CH-1 of an SSVM to the left channel of the audio output terminal, CH-2 to the right channel of the audio output terminal and adjust R609 [R639] so that the reading of the SSVM is -8 ± 0.5dBs.

Checking of erase voltage and oscillation frequency

Measuring instrument	Oscilloscope
Mode	Recording
Input signal	————
Test point	Across full-erase head
Control	———— (none)
Specification	70 ± 5kHz, more that 50 Vp-p

1. Set the unit in record mode.
2. Hook up the oscilloscope across 2 lead wires of the full-erase head.
3. Make sure the erase voltage is over 50 Vp-p.
4. Be sure that the oscillation frequency is 70 ± 5kHz.

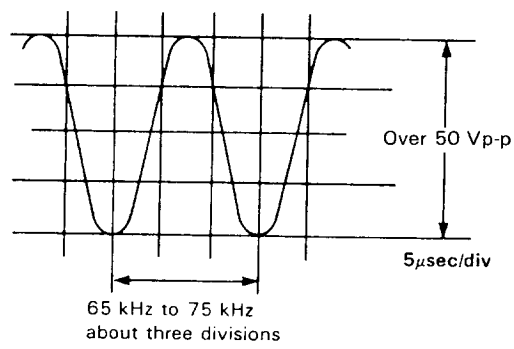


Figure 2-13.

Adjustment of bias current

Measuring instrument	SSVM
Mode	Recording
Input signal	————
Test points	TP601 (SIG), TP602 (GND) [TP603(SIG), TP604(GND)]
Control	R667[R666]
Specification	340 ± 10μA (3.4 ± 0.1mVrms)

1. Set the unit in record mode.
2. Connect the SSVM to TP601[TP603] and TP602[TP604], and adjust R667[R666] (bias current control) so that the bias current is 340 ± 10μA (3.4 ± 0.1mVrms).

Checking of biak leak

Measuring instrument	SSVM
Mode	Self-recording /playback
Input sigual	————
Test point	Audio output terminal
Control	————
Specification	Less than - 20 dBm (75mV)

1. Set the unit in record mode.
2. Connect the SSVM to the audio output terminal.
3. Make sure the bias leak is below -20 dB.

Checking of recording level

Measuring instrument	SSVM
Mode	Self-recording /playback
Input sigual	1 kHz / - 8 dBm (300mVrms)
Test point	Audio output terminal
Specification	-5 ± 3 dBm

1. Feed 1kHz, -8 dBm signal to the audio input terminal. Make a self-recording tape and play.
2. Make sure the PB signal at the audio output terminal is -5 ± 3 dBm. (0.3V~0.62Vrms)
3. If out of specified value, readjust the playback level and the bias current.

Note: (For stereo recording, feed the signal to the left and right channels at the same time.)

■ ADJUSTMENT OF THE IF CIRCUIT

- **Test point layout**

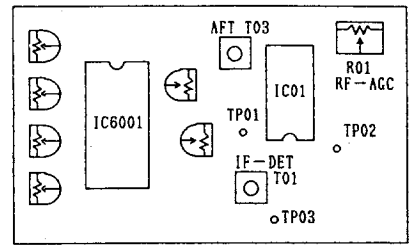


Figure 2-14. IF PWB

Adjistment of THE AFT circuit

Measuring instrument	SSVM
Mode	Test (see below)
Input signal	TV broadcast
Test point	TP1502 AFT(on Main PWB) TP1503GND(on Main PWB)
Control	T03
Specification	4.0 ± 0.2 V

1. Connect the antenna and receive a TV station.
   Note:
   Make a short-circuit between TP5001 and TP5002on the timer PWB in order to have the unit in test mode.
2. Connect the SSVM's positive lead and negative lead to TP1502 and TP1503 respectively.
3. Adjust the AFT coil so that the voltmeter reads 4.0 ± 0.2V.
   Note:
   Turn the core of the AFT coil all the way clockwise. Then turn it counterclockwise gradually until the voltmeter reads 4.0 V.

Adjustment of the RF AGC

Measuring instrument	SSVM
Mode	————
Input signal	Good TV broad cast
Test point	TP1501AGC(on Main PWB) TP1503GND(on Main PWB)
Control	R01 (See Fig. 2-14.)
Specification	5.3 ± 0.2 V (AGC Voltage cut-in level.)

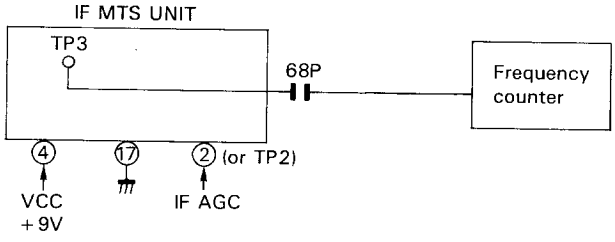
1. Receive a TV station.
2. Adjust the antenna input field strength to 68 ± 2 dBμ. (2~3mV)
3. Connect the SSVM's positive lead and negative lead to TP1502 and TP1504, respectively.
4. Adjust R01 (RF AGC control) so that the AGC Voltage cut-in level is 5.3 ± 0.2 V.

MTS ADJUSTMENT PROCEDURES
(This adjustment is performed after IF/MTS unit is removed.)

Adjustment of VCO (TO1)

Measuring instrument	Frequency counter
Mode	————
Input signal	———— (None)
Test point	TP3 (IC01㉘)
Adjusting point	T01
Specification	45.75 MHz

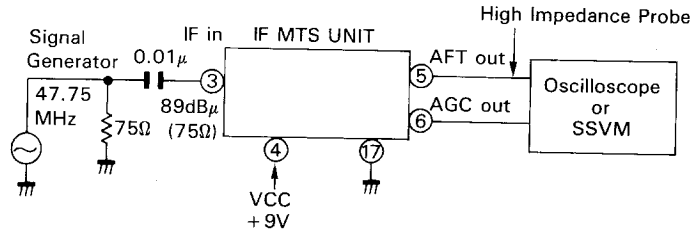
1. Connect instruments as below drawing.
2. Feed + 9V to pin ④ and + 6V to pin ② of the IF MTS UNIT from a DC power supply.
3. Adjust T01 so that the frequency on TP3 is 45.75 MHz.



Adjustment of AFT(TO3)and RF AGC (RO1)

Measuring instrument	Oscilloscope
Mode	————
Input signal	47.75 MHz/89dBμ (28mV)
Test point	Pin ⑤ of IF MTS UNIT Pin ⑥ of IF MTS UNIT
Controls	T03, R01
Specification	4.5 ± 0.3V_{DC}, 3.0V_{DC}

1. Connect instrument as shown below.
2 .Feed + 9V to pin ④ of the IF MTS UNIT.

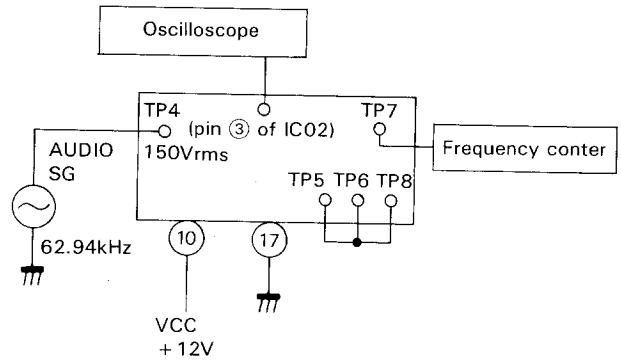


3. Feed 45.75 MHz and 89dBμ signal to pin③ of the IF MTS UNIT and adjust T03 so that the DC Voltage of IF MTS UNIT becomes 4.5 ± 0.3 V_{DC}.
4. Then adjust R01 so that the voltage of RF AGC becomes 3.0 V_{DC}.

Adjustment of SAP, BPF and STEREO VCO (R65, R69)

Measuring instrument	Oscilloscope, Frequency counter
Mode	————
Input signal	62.94 kHz/150mVrms
Test points	Pin ③ of IC02, TP7
Control	R69
Specification	Minimum, 15.784 kHz

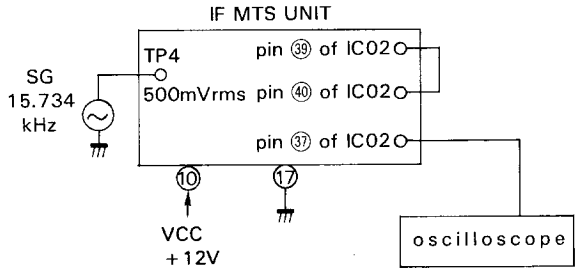
1. Connect instrument as shown below.
2. Feed + 12V to pin ⑩ of IF MTS UNIT from a DC power supply.
3. After 5 minutes of power supply, feed 62.94 kHz and 150mVrms signals to TP4 and adjust R65 so that the output on pin ③ of IC02 is minumum.
4. Connect TP5, TP6 and TP8 together to make a short-circuit. Read the output of TP7 on the frequency counter and adjust R69 to get 15.784 kHz.



Adjustment of dbx

Measuring instrument	Oscilloscope
Mode	————
Input signal	15.734kHz/500mVrms
Test point	Pin ㊲ of IC02
Control	R66
Specification	Minimum

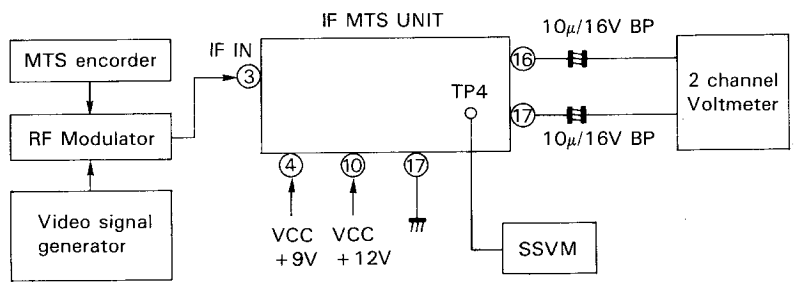
1. Connect instruments as follows.
2. Feed + 12V to pin ⑩ of the IF MTS.
3. Feed a 15.734 kHz and 500mVrms signal to TP4 and have a short-circuit between pin ㊴ and pin ㊵ of IC02. Then Obserb the output of pin ㊲ of IC02 through a 15.734 kHz B.P.F. and read it on the oscilloscope.
4. Adjust R66 so that the amplitude is mimimized.



Adjustment of MTS input level (R64) and stereo separation (R67 and R68)

Measuring instrument	SSVM
Mode	————
Input signal	Modulation signal
Test points	TP4, Audio output terminal (L-ch)
Controls	R64, R67, R68
Specification	247.5mVrms, -14.5dBm, -15.5dBm

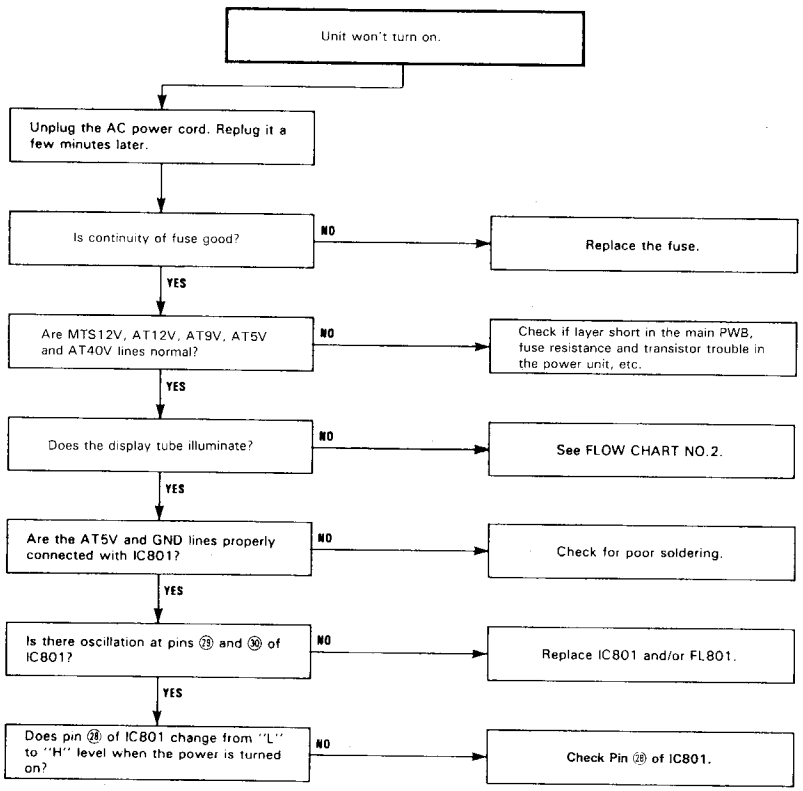
1. Connect instruments as follows.
2. Feed + 9V to pin ④ and + 12V to pin ⑩ of the IFMTS UNIT from the DC power supply.
3. Set voice signal to 400Hz and the modulation factor to 100% for IF IN and adjust R64 so that the output of TP4 becomes 247.5mVrms.
4. Set the voice signal to 300Hz and the modulation factor to 30% (L-only) and adjust R67 so that the L-CH output becomes-14.5dBm.
5. Set the voice signal to 3kHz and modulation factor to 30% (L-only) and adjust R68 so that the L-CH output becomes -15.5dBm.



TROUBLESHOOTING

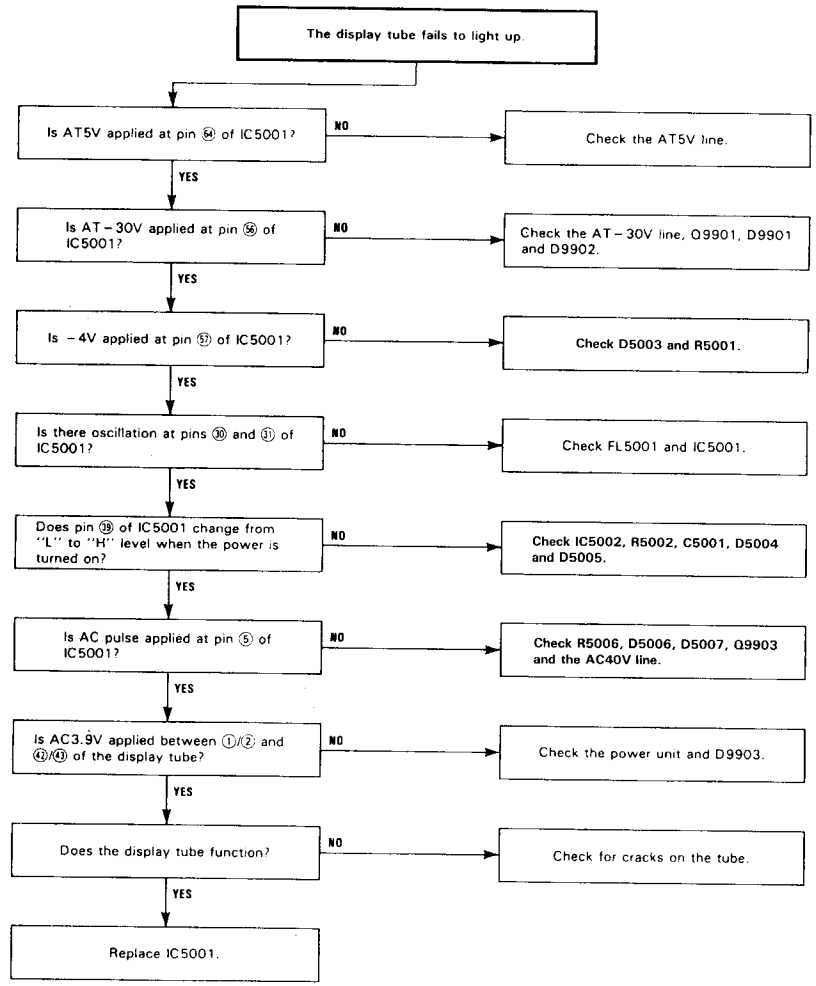
FLOW CHART NO.1

POWER TROUBLESHOOTING


Unit won't turn on.
Unplug the AC power cord. Replug it a few minutes later.
Is continuity of fuse good?
NO
Replace the fuse.
YES
Are MTS12V, AT12V, AT9V, AT5V and AT40V lines normal?
NO
Check if layer short in the main PWB, fuse resistance and transistor trouble in the power unit, etc.
YES
Does the display tube illuminate?
NO
See FLOW CHART NO.2.
YES
Are the AT5V and GND lines properly connected with IC801?
NO
Check for poor soldering.
YES
Is there oscillation at pins ㉙ and ㉚ of IC801?
NO
Replace IC801 and/or FL801.
YES
Does pin ㉘ of IC801 change from "L" to "H" level when the power is turned on?
NO
Check Pin ㉘ of IC801.

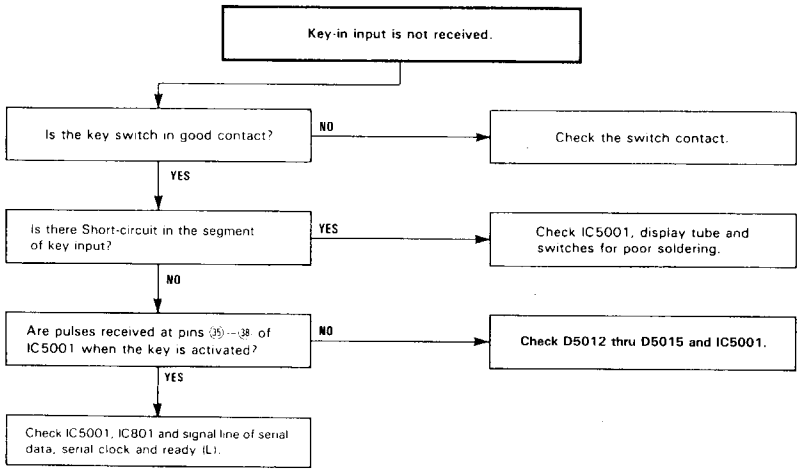
FLOW CHART NO.2

TIMER (1) TROUBLESHOOTING


The display tube fails to light up.
Is AT5V applied at pin ㊹ of IC5001?
NO
Check the AT5V line.
YES
Is AT−30V applied at pin ㊻ of IC5001?
NO
Check the AT−30V line, Q9901, D9901 and D9902.
YES
Is −4V applied at pin ㊼ of IC5001?
NO
Check D5003 and R5001.
YES
Is there oscillation at pins ㉚ and ㉛ of IC5001?
NO
Check FL5001 and IC5001.
YES
Does pin ㉙ of IC5001 change from "L" to "H" level when the power is turned on?
NO
Check IC5002, R5002, C5001, D5004 and D5005.
YES
Is AC pulse applied at pin ⑤ of IC5001?
NO
Check R5006, D5006, D5007, Q9903 and the AC40V line.
YES
Is AC3.9V applied between ①/② and ㊷/㊸ of the display tube?
NO
Check the power unit and D9903.
YES
Does the display tube function?
NO
Check for cracks on the tube.
YES
Replace IC5001.

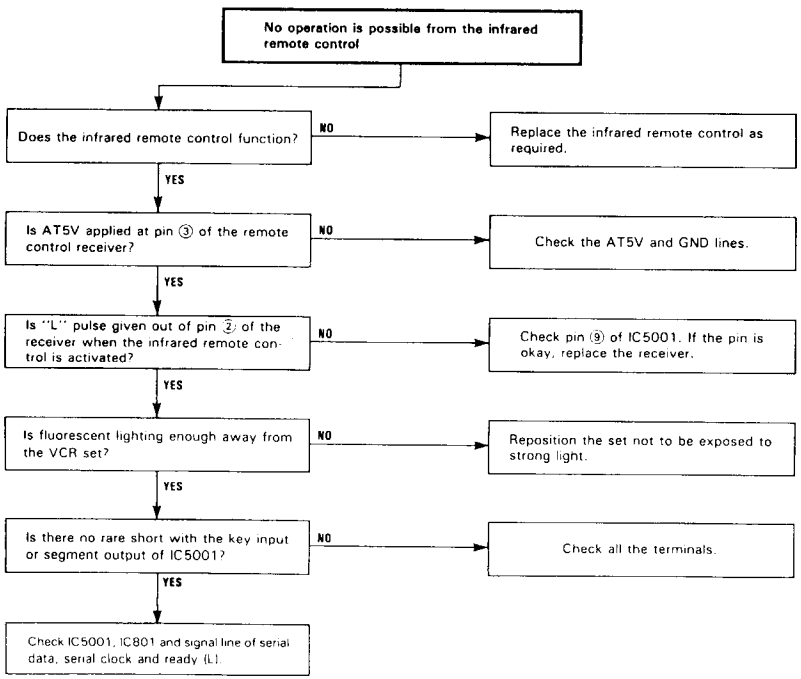
TIMER (2) TROUBLESHOOTING

FLOW CHART NO.3


Key-in input is not received.
Is the key switch in good contact?
NO
Check the switch contact.
YES
Is there Short-circuit in the segment of key input?
YES
Check IC5001, display tube and switches for poor soldering.
NO
Are pulses received at pins ㉟--㊳ of IC5001 when the key is activated?
NO
Check D5012 thru D5015 and IC5001.
YES
Check IC5001, IC801 and signal line of serial data, serial clock and ready (L).

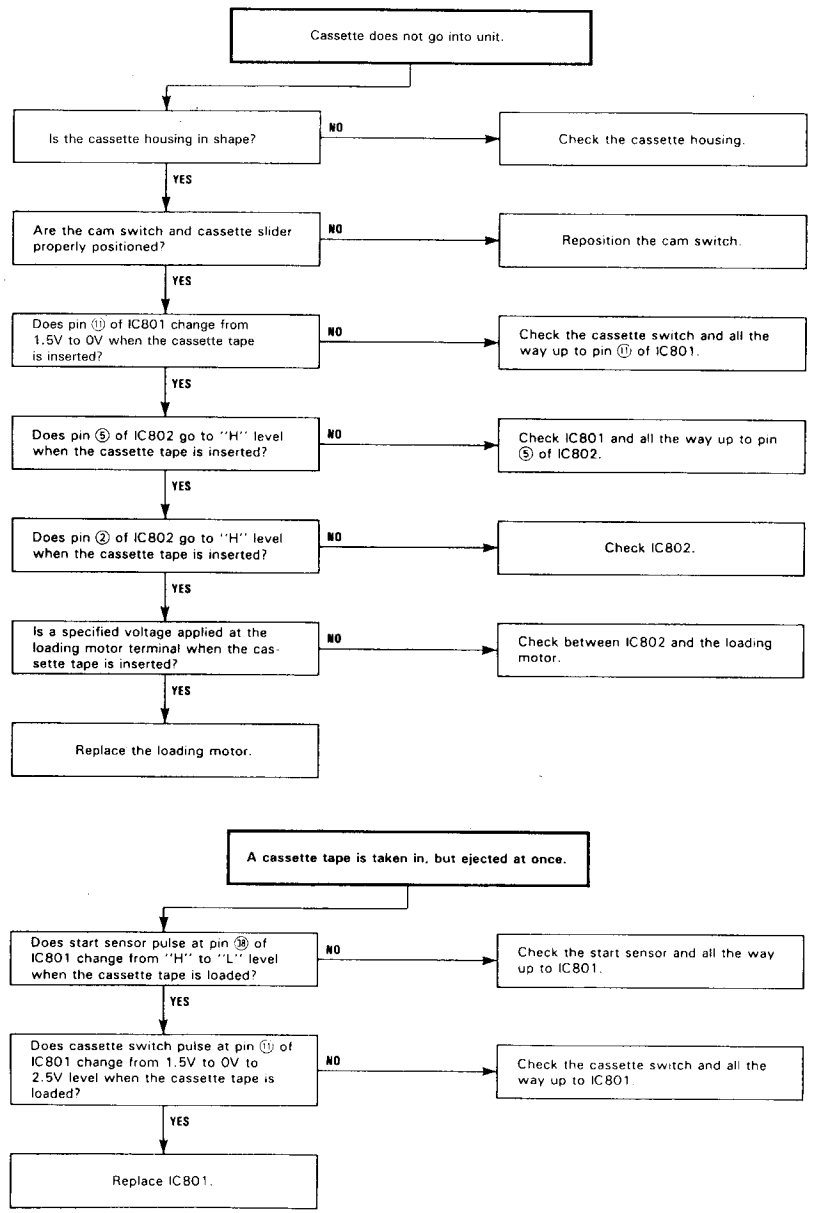
INFRARED R/C TROUBLESHOOTING

FLOW CHART NO.4


No operation is possible from the infrared remote control
Does the infrared remote control function?
NO
Replace the infrared remote control as required.
YES
Is AT5V applied at pin ③ of the remote control receiver?
NO
Check the AT5V and GND lines.
YES
Is "L" pulse given out of pin ② of the receiver when the infrared remote control is activated?
NO
Check pin ⑨ of IC5001. If the pin is okay, replace the receiver.
YES
Is fluorescent lighting enough away from the VCR set?
NO
Reposition the set not to be exposed to strong light.
YES
Is there no rare short with the key input or segment output of IC5001?
NO
Check all the terminals.
YES
Check IC5001, IC801 and signal line of serial data, serial clock and ready (L).

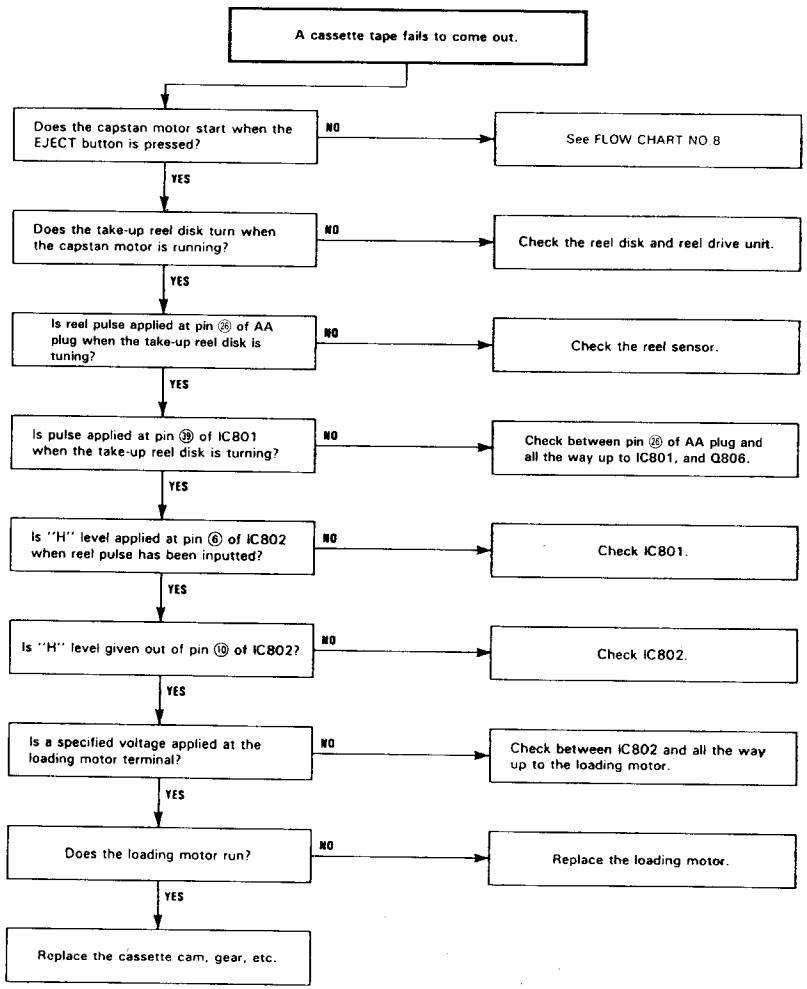
CASSETTE CONTROL TROUBLESHOOTING

FLOW CHART NO.5


Cassette does not go into unit.
Is the cassette housing in shape?
NO
Check the cassette housing.
YES
Are the cam switch and cassette slider properly positioned?
NO
Reposition the cam switch.
YES
Does pin ⑪ of IC801 change from 1.5V to 0V when the cassette tape is inserted?
NO
Check the cassette switch and all the way up to pin ⑪ of IC801.
YES
Does pin ⑤ of IC802 go to "H" level when the cassette tape is inserted?
NO
Check IC801 and all the way up to pin ⑤ of IC802.
YES
Does pin ② of IC802 go to "H" level when the cassette tape is inserted?
NO
Check IC802.
YES
Is a specified voltage applied at the loading motor terminal when the cassette tape is inserted?
NO
Check between IC802 and the loading motor.
YES
Replace the loading motor.
A cassette tape is taken in, but ejected at once.
Does start sensor pulse at pin ㊳ of IC801 change from "H" to "L" level when the cassette tape is loaded?
NO
Check the start sensor and all the way up to IC801.
YES
Does cassette switch pulse at pin ⑪ of IC801 change from 1.5V to 0V to 2.5V level when the cassette tape is loaded?
NO
Check the cassette switch and all the way up to IC801.
YES
Replace IC801.

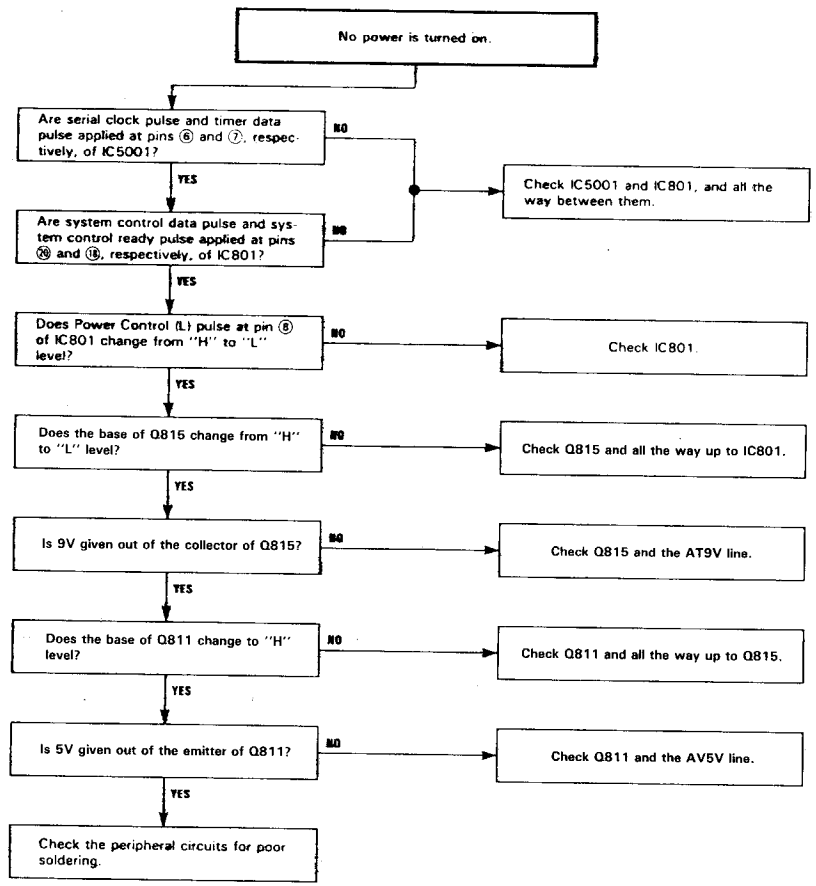
LOADING MOTOR AND EJECT TROUBLESHOOTING

FLOW CHART NO.6


A cassette tape fails to come out.
Does the capstan motor start when the EJECT button is pressed?
NO
See FLOW CHART NO 8
YES
Does the take-up reel disk turn when the capstan motor is running?
NO
Check the reel disk and reel drive unit.
YES
Is reel pulse applied at pin ㉖ of AA plug when the take-up reel disk is tuning?
NO
Check the reel sensor.
YES
Is pulse applied at pin ⑲ of IC801 when the take-up reel disk is turning?
NO
Check between pin ㉖ of AA plug and all the way up to IC801, and Q806.
YES
Is "H" level applied at pin ⑥ of IC802 when reel pulse has been inputted?
NO
Check IC801.
YES
Is "H" level given out of pin ⑩ of IC802?
NO
Check IC802.
YES
Is a specified voltage applied at the loading motor terminal?
NO
Check between IC802 and all the way up to the loading motor.
YES
Does the loading motor run?
NO
Replace the loading motor.
YES
Replace the cassette cam, gear, etc.

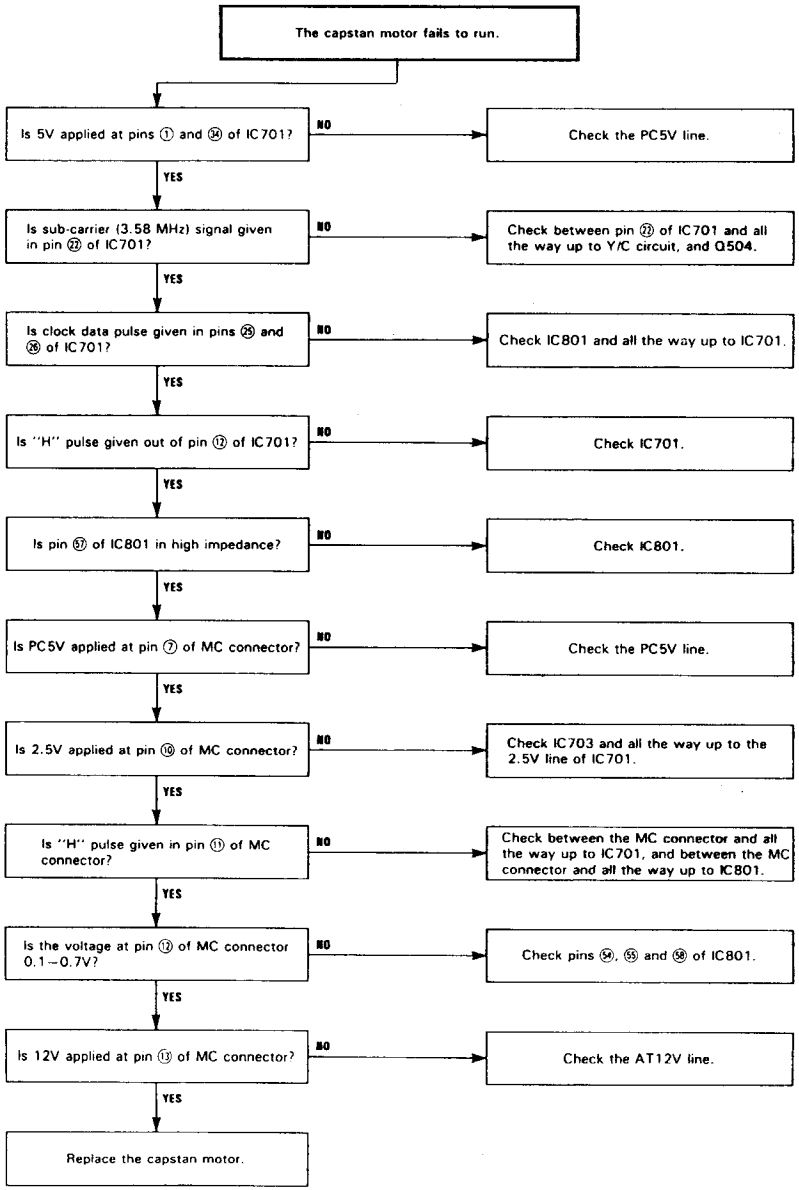
SYSTEM CONTROL TROUBLESHOOTING

FLOW CHART NO.7


No power is turned on.
Are serial clock pulse and timer data pulse applied at pins ⑥ and ⑦, respectively, of IC5001?
NO
YES
Are system control data pulse and system control ready pulse applied at pins ㉖ and ⑱, respectively, of IC801?
NO
Check IC5001 and IC801, and all the way between them.
YES
Does Power Control (L) pulse at pin ⑧ of IC801 change from "H" to "L" level?
NO
Check IC801.
YES
Does the base of Q815 change from "H" to "L" level?
NO
Check Q815 and all the way up to IC801.
YES
Is 9V given out of the collector of Q815?
NO
Check Q815 and the AT9V line.
YES
Does the base of Q811 change to "H" level?
NO
Check Q811 and all the way up to Q815.
YES
Is 5V given out of the emitter of Q811?
NO
Check Q811 and the AV5V line.
YES
Check the peripheral circuits for poor soldering.

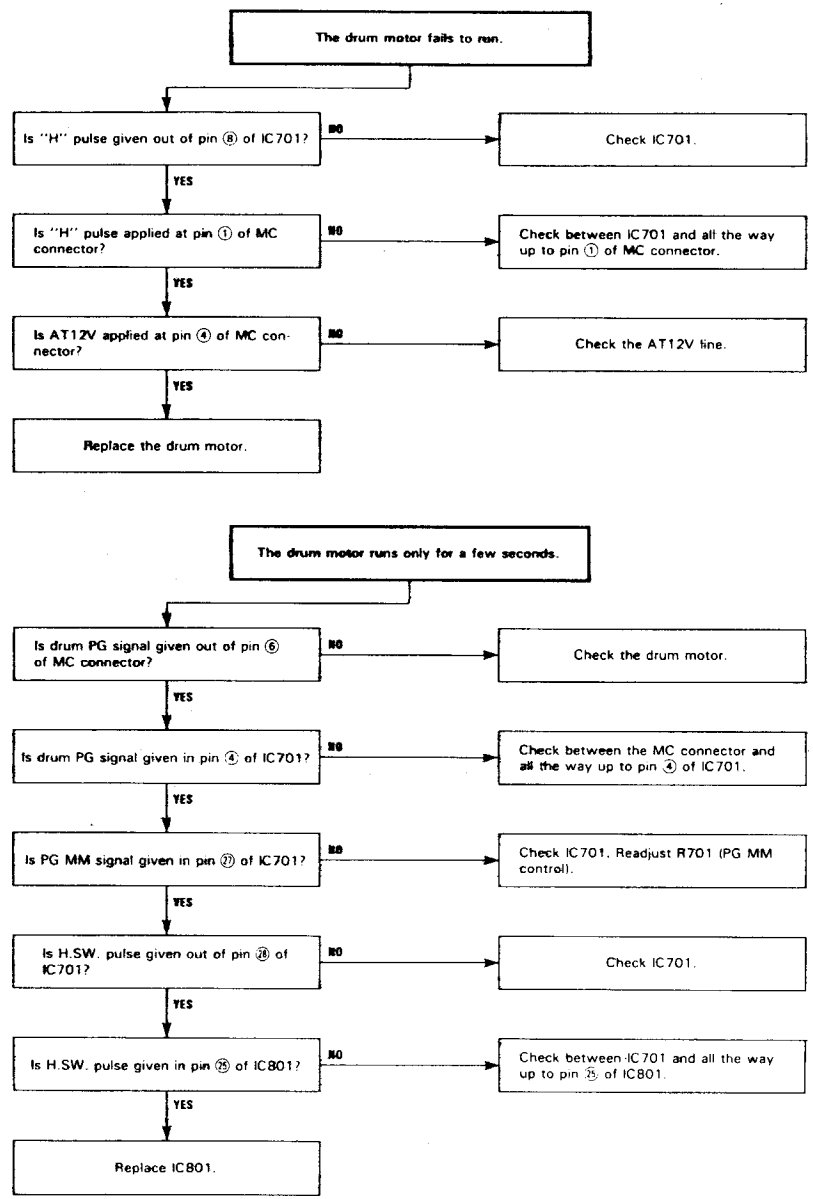
CAPSTAN MOTOR TROUBLESHOOTING

FLOW CHART NO.8


The capstan motor fails to run.
Is 5V applied at pins ① and ㉞ of IC701?
NO
Check the PC5V line.
YES
Is sub-carrier (3.58 MHz) signal given in pin ㉒ of IC701?
NO
Check between pin ㉒ of IC701 and all the way up to Y/C circuit, and Q504.
YES
Is clock data pulse given in pins ㉕ and ㉖ of IC701?
NO
Check IC801 and all the way up to IC701.
YES
Is "H" pulse given out of pin ⑫ of IC701?
NO
Check IC701.
YES
Is pin ㊼ of IC801 in high impedance?
NO
Check IC801.
YES
Is PC5V applied at pin ⑦ of MC connector?
NO
Check the PC5V line.
YES
Is 2.5V applied at pin ⑩ of MC connector?
NO
Check IC703 and all the way up to the 2.5V line of IC701.
YES
Is "H" pulse given in pin ⑪ of MC connector?
NO
Check between the MC connector and all the way up to IC701, and between the MC connector and all the way up to IC801.
YES
Is the voltage at pin ⑫ of MC connector 0.1–0.7V?
NO
Check pins ㊹, ㊺ and ㊽ of IC801.
YES
Is 12V applied at pin ⑬ of MC connector?
NO
Check the AT12V line.
YES
Replace the capstan motor.

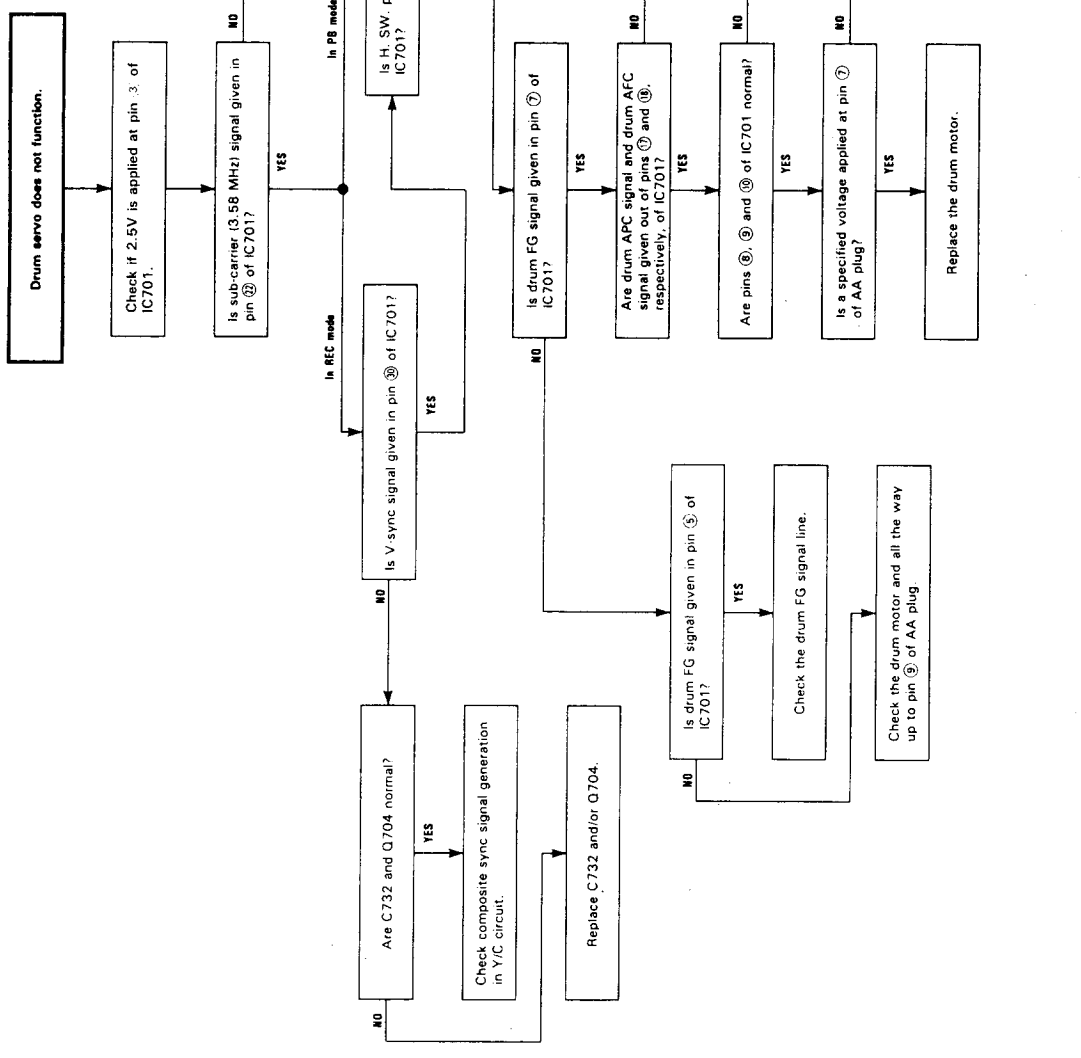
DRUM MOTOR TROUBLESHOOTING

FLOW CHART NO.9


The drum motor fails to run.
Is "H" pulse given out of pin ⑧ of IC701?
NO
Check IC701.
YES
Is "H" pulse applied at pin ① of MC connector?
NO
Check between IC701 and all the way up to pin ① of MC connector.
YES
Is AT12V applied at pin ④ of MC connector?
NO
Check the AT12V line.
YES
Replace the drum motor.
The drum motor runs only for a few seconds.
Is drum PG signal given out of pin ⑥ of MC connector?
NO
Check the drum motor.
YES
Is drum PG signal given in pin ④ of IC701?
NO
Check between the MC connector and all the way up to pin ④ of IC701.
YES
Is PG MM signal given in pin ㉗ of IC701?
NO
Check IC701. Readjust R701 (PG MM control).
YES
Is H.SW. pulse given out of pin ㉘ of IC701?
NO
Check IC701.
YES
Is H.SW. pulse given in pin ㉕ of IC801?
NO
Check between IC701 and all the way up to pin ㉕ of IC801.
YES
Replace IC801.

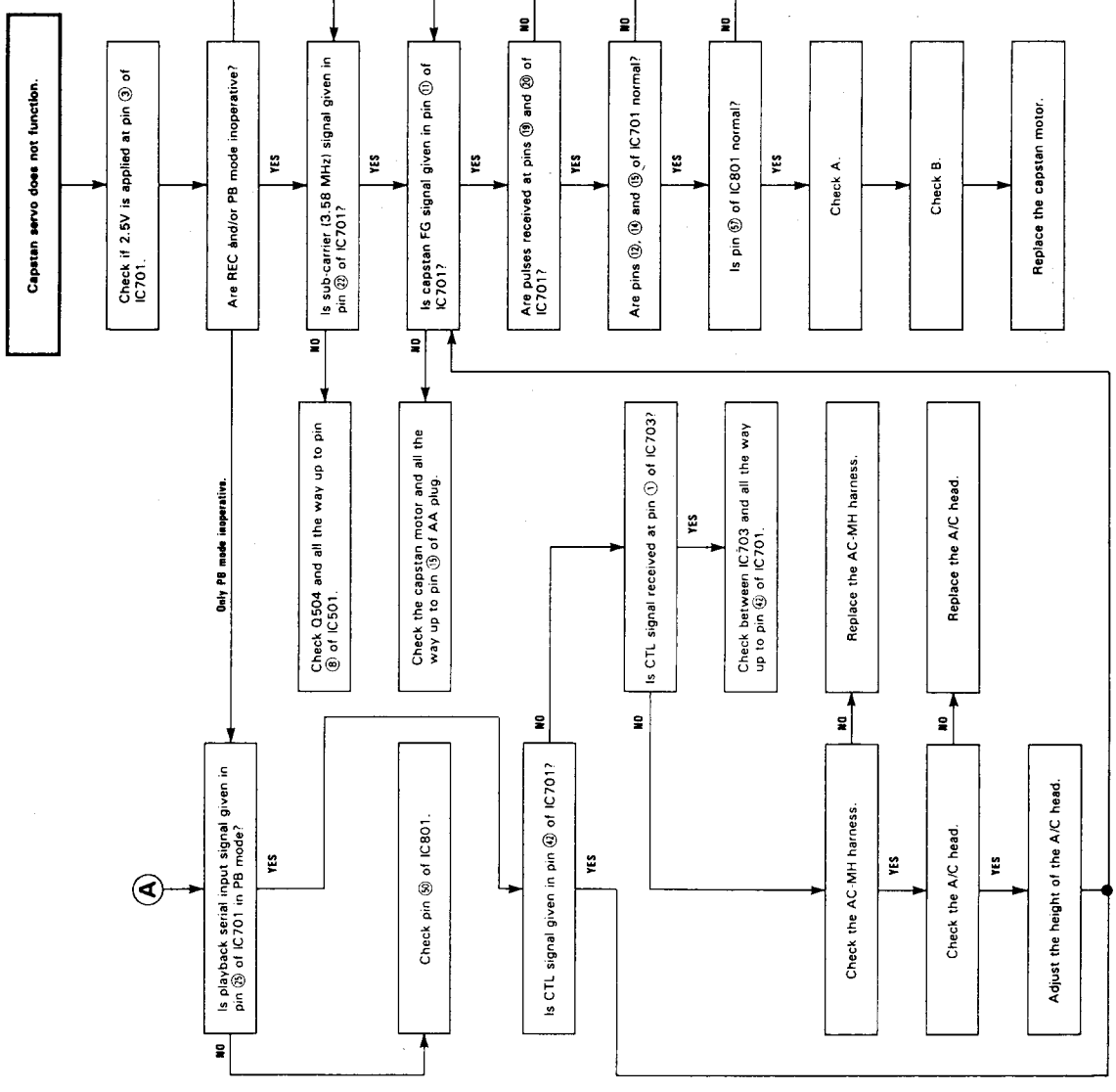
FLOW CHART

DRUM SERVO TROUBLESHOOTING


Drum servo does not function.
Check if 2.5V is applied at pin ③ of IC701.
Is sub-carrier (3.58 MHz) signal given in pin ㉒ of IC701?
NO
Check Q504 and all the way up to pin ⑧ of IC501.
YES
In PB mode
In REC mode
Is H. SW. pulse given out of pin ㉘ of IC701?
NO
Are there proper waveforms at pins ④ and ㉗ of IC701?
NO
Check pin ㉗ of AA plug and drum motor, and replace IC701.
YES
Replace IC701.
YES
Is V.sync signal given in pin ㉚ of IC701?
NO
Are C732 and Q704 normal?
NO
Replace C732 and/or Q704.
YES
Check composite sync signal generation in Y/C circuit.
YES
Is drum FG signal given in pin ⑦ of IC701?
NO
Is drum FG signal given in pin ⑤ of IC701?
NO
Check the drum motor and all the way up to pin ⑨ of AA plug.
YES
Check the drum FG signal line.
YES
Are drum APC signal and drum AFC signal given out of pins ⑰ and ⑱, respectively, of IC701?
NO
Replace IC701.
YES
Are pins ⑧, ⑨ and ⑲ of IC701 normal?
NO
Replace IC701.
YES
Is a specified voltage applied at pin ⑦ of AA plug?
NO
Does pin ㊾ of IC801 go to "L" level?
NO
Check the AA plug.
YES
Replace IC801.
YES
Replace the drum motor.

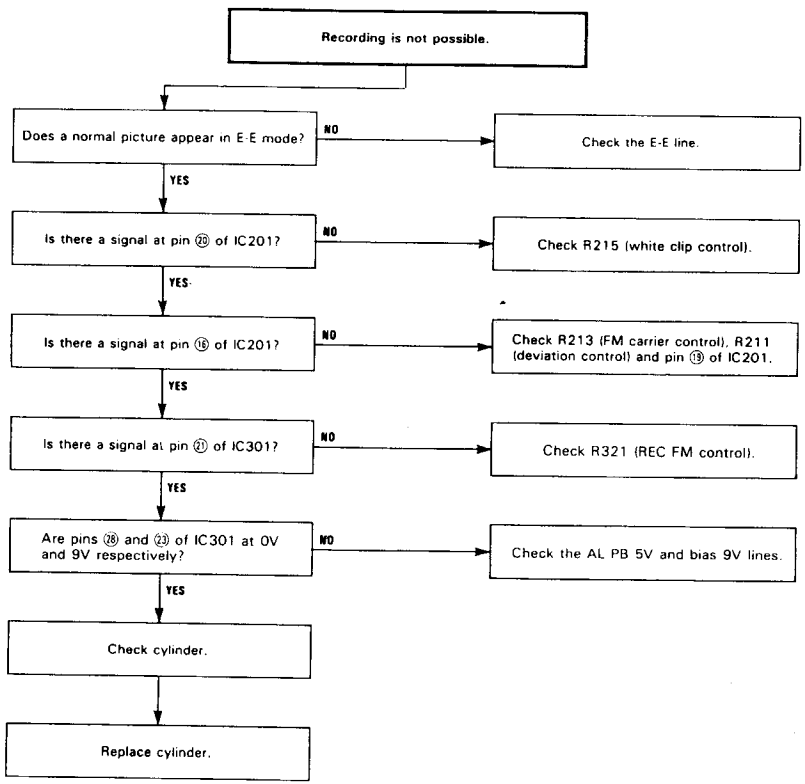
FLOW CHART NO.11

CAPSTAN SERVO TROUBLESHOOTING


Capstan servo does not function.
Check if 2.5V is applied at pin ③ of IC701.
Are REC and/or PB mode inoperative?
YES
Only REC mode inoperative.
Only PB mode inoperative.
Is sub-carrier (3.58 MHz) signal given in pin ㉒ of IC701?
YES
NO
Check Q504 and all the way up to pin ⑧ of IC501.
Is capstan FG signal given in pin ⑪ of IC701?
YES
NO
Check the capstan motor and all the way up to pin ⑮ of AA plug.
Are pulses received at pins ⑲ and ⑳ of IC701?
YES
NO
Replace IC701.
Are pins ⑫, ⑭ and ⑮ of IC701 normal?
YES
NO
Replace IC701.
Is pin ㊲ of IC801 normal?
YES
NO
Replace IC801.
Check A.
Check B.
Replace the capstan motor.
Is recording serial input signal given in pin ㉕ of IC701 in REC mode?
YES
NO
Are H. SW. pulse and V-sync signal received at pins ㉙ and ㉚, respectively, IC701?
YES
NO
Are CTL signals given out of pins ㉖ and ㉗ of IC701?
YES
NO
Check the H. SW. pulse and V-sync signal lines.
Check pin ㊱ of IC801.
Is playback serial input signal given in pin ㉕ of IC701 in PB mode?
YES
NO
Check pin ㊱ of IC801.
Is CTL signal given in pin ㊷ of IC701?
YES
NO
Is CTL signal received at pin ① of IC703?
YES
NO
Check between IC703 and all the way up to pin ㊷ of IC701.
Check the AC-MH harness.
YES
NO
Replace the AC-MH harness.
Check the A/C head.
YES
NO
Replace the A/C head.
Adjust the height of the A/C head.

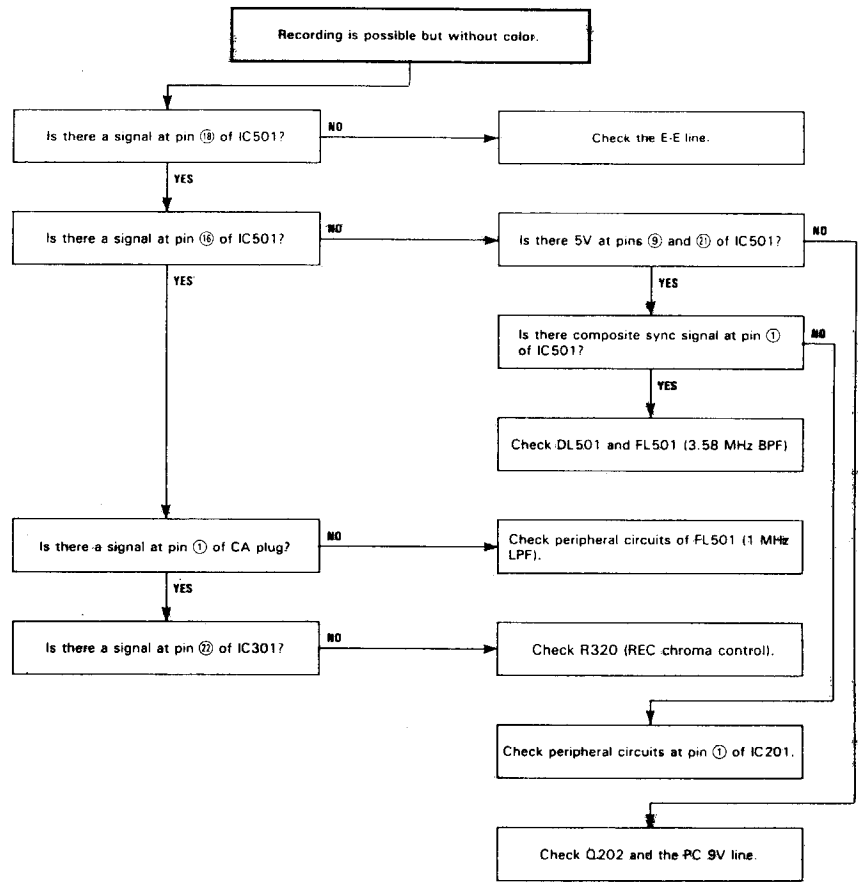
RECORDING MODE (LUMINANCE) TROUBLESHOOTING

FLOW CHART NO.12


Recording is not possible.
Does a normal picture appear in E-E mode?
NO
Check the E-E line.
YES
Is there a signal at pin ⑳ of IC201?
NO
Check R215 (white clip control).
YES
Is there a signal at pin ⑯ of IC201?
NO
Check R213 (FM carrier control), R211 (deviation control) and pin ⑲ of IC201.
YES
Is there a signal at pin ㉑ of IC301?
NO
Check R321 (REC FM control).
YES
Are pins ㉘ and ㉓ of IC301 at 0V and 9V respectively?
NO
Check the AL PB 5V and bias 9V lines.
YES
Check cylinder.
Replace cylinder.

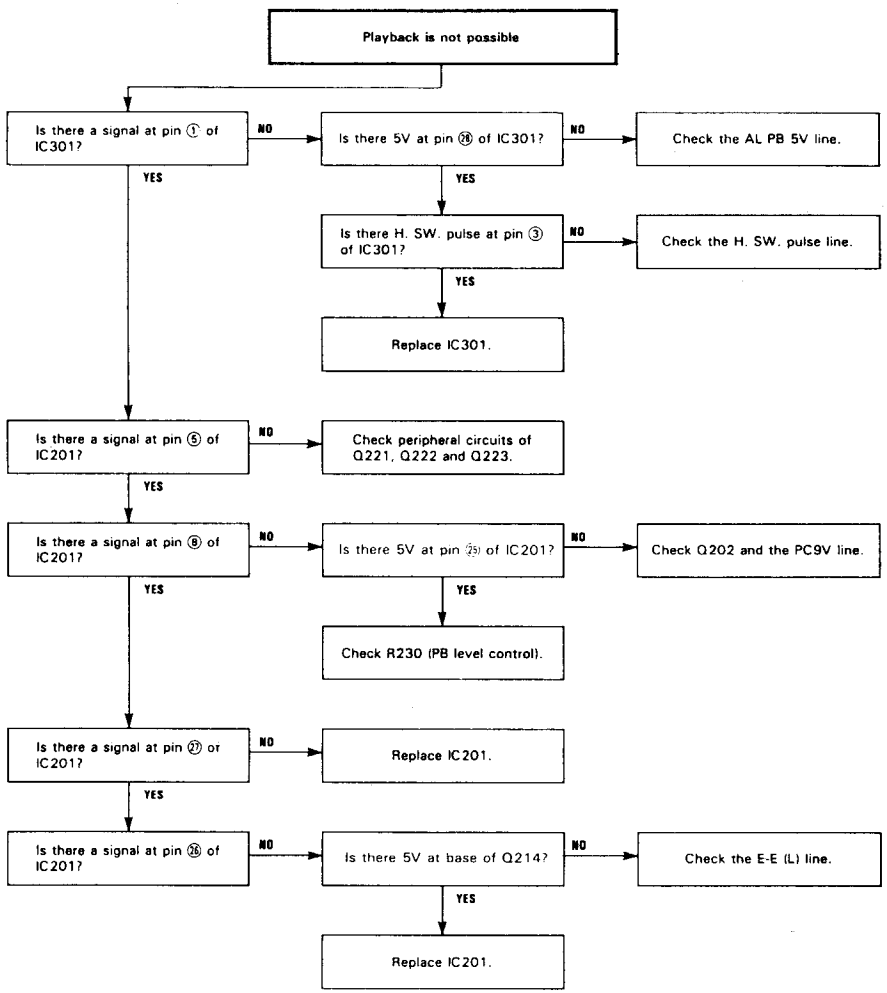
RECORDING MODE (CHROMA) TROUBLESHOOTING

FLOW CHART NO.13


Recording is possible but without color.
Is there a signal at pin ⑱ of IC501?
NO
Check the E-E line.
YES
Is there a signal at pin ⑯ of IC501?
NO
Is there 5V at pins ⑨ and ㉑ of IC501?
NO
YES
YES
Is there composite sync signal at pin ① of IC501?
NO
YES
Check DL501 and FL501 (3.58 MHz BPF)
Is there a signal at pin ① of CA plug?
NO
Check peripheral circuits of FL501 (1 MHz LPF).
YES
Is there a signal at pin ㉒ of IC301?
NO
Check R320 (REC chroma control).
Check peripheral circuits at pin ① of IC201.
Check Q202 and the PC 9V line.

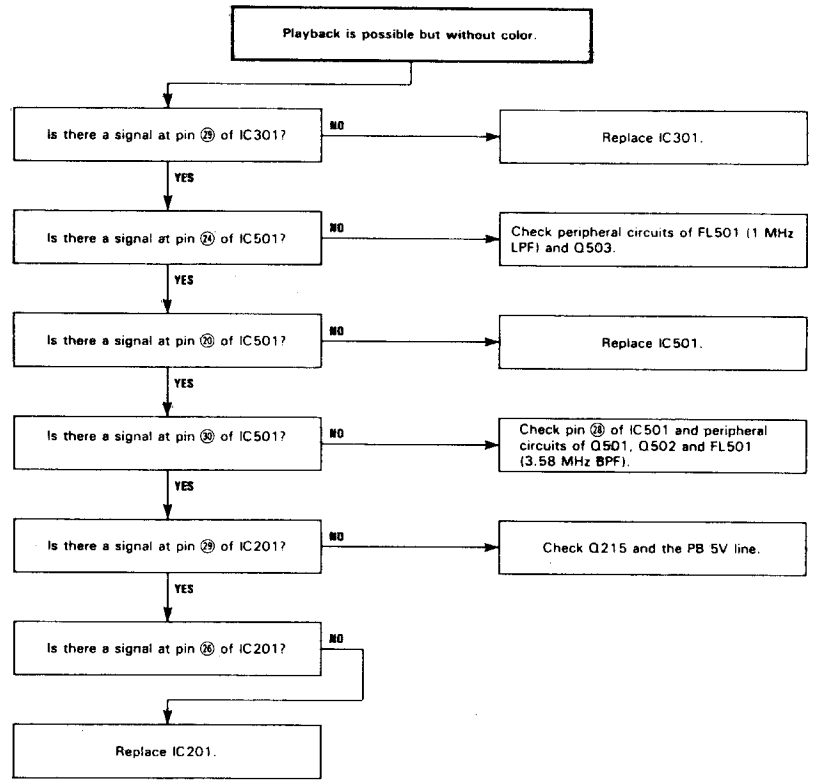
PLAYBACK MODE (LUMINANCE) TROUBLESHOOTING

FLOW CHART NO.14



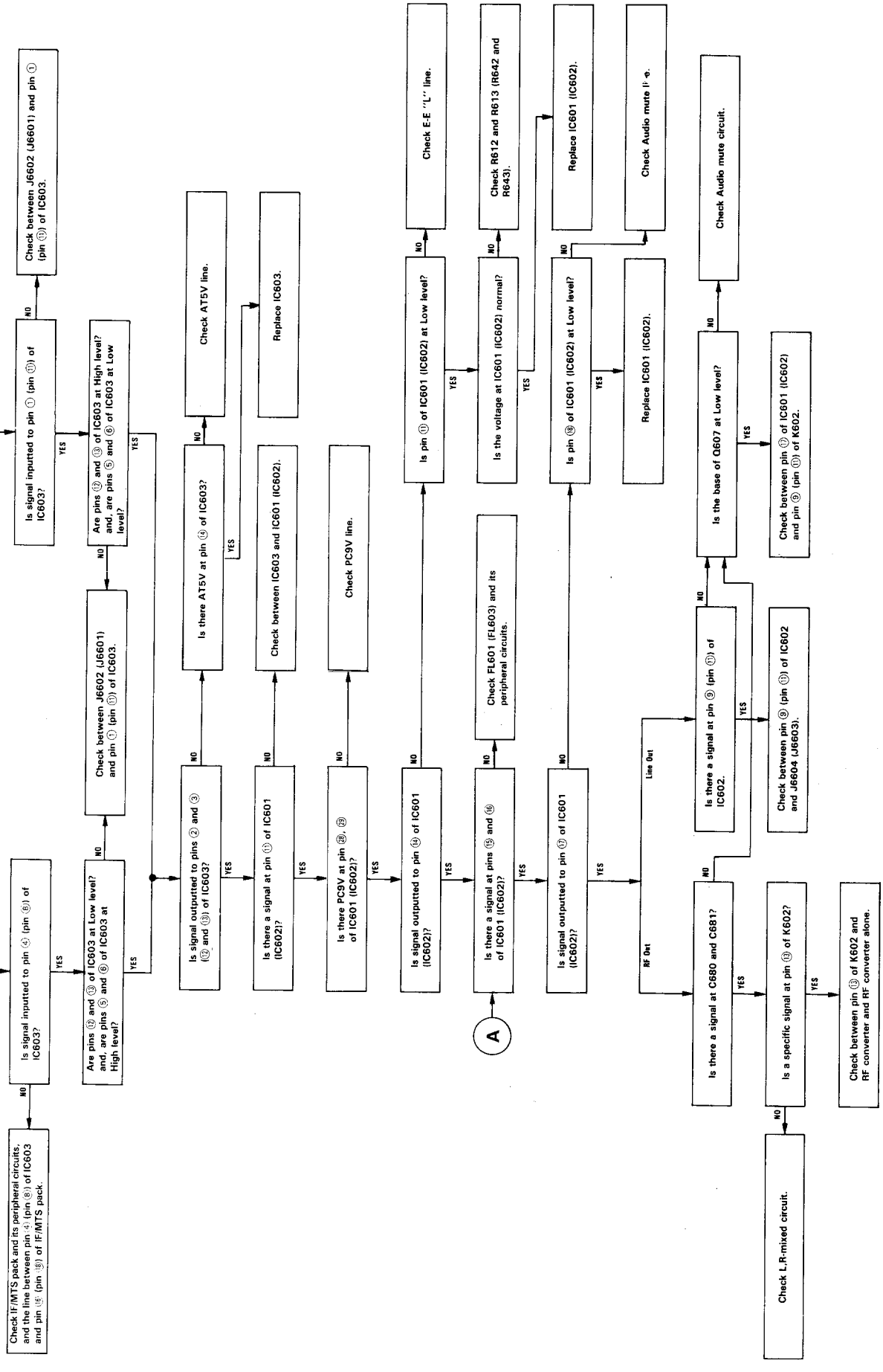
PLAYBACK MODE (CHROMA) TROUBLESHOOTING

FLOW CHART NO.15

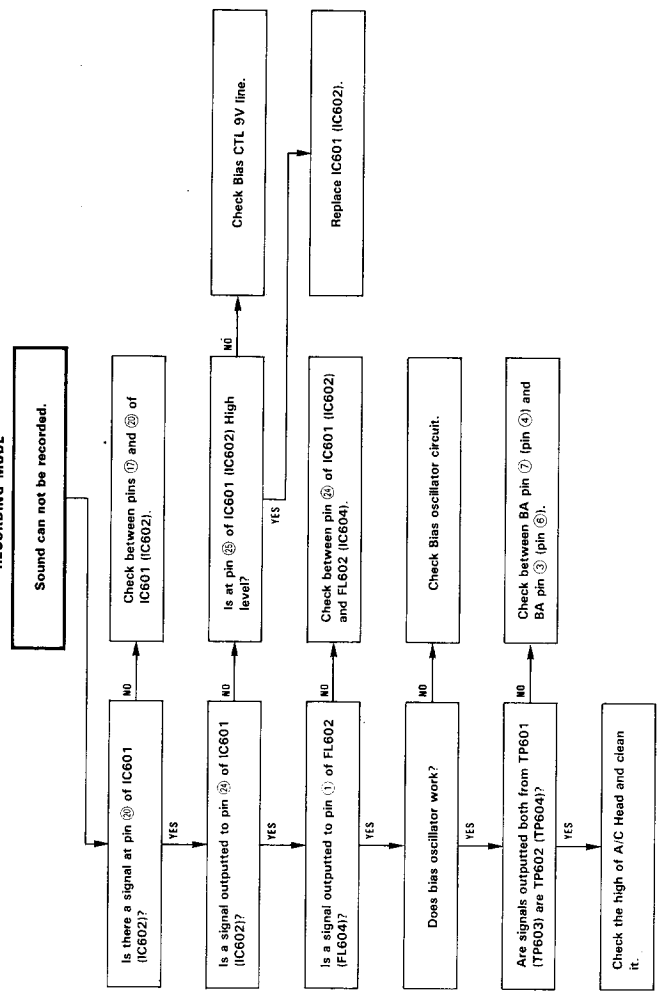

Playback is possible but without color.
Is there a signal at pin ㉙ of IC301?
NO
Replace IC301.
YES
Is there a signal at pin ㉔ of IC501?
NO
Check peripheral circuits of FL501 (1 MHz LPF) and Q503.
YES
Is there a signal at pin ㉚ of IC501?
NO
Replace IC501.
YES
Is there a signal at pin ㉚ of IC501?
NO
Check pin ㉘ of IC501 and peripheral circuits of Q501, Q502 and FL501 (3.58 MHz BPF).
YES
Is there a signal at pin ㉙ of IC201?
NO
Check Q215 and the PB 5V line.
YES
Is there a signal at pin ㉖ of IC201?
NO
Replace IC201.

FLOW CHART NO. 16

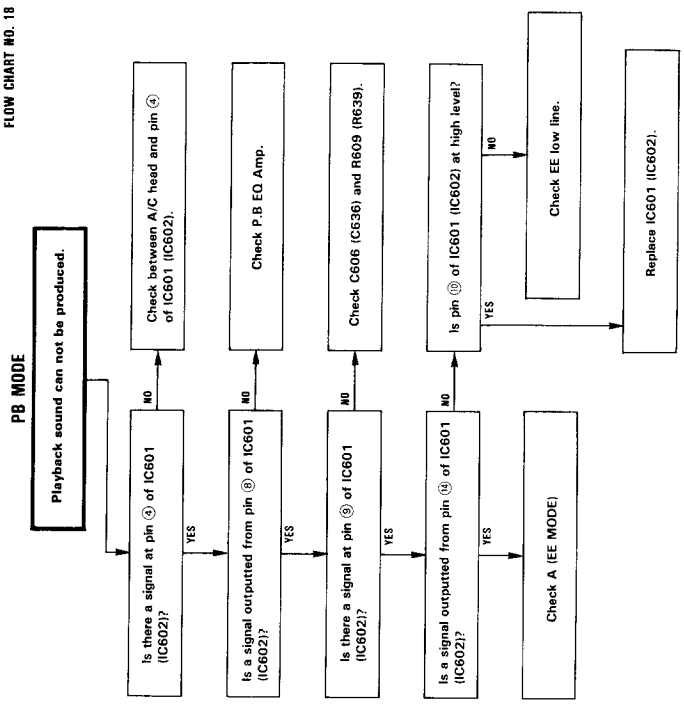
Inside ( ) is R-CH


AUDIO E-E MODE
E-E sound is not produced.
In TV mode
In Aux mode.
Is signal inputted to pin ④ (pin ⑥) of IC603?
NO
YES
Check IF/MTS pack and its peripheral circuits, and the line between pin ④ (pin ⑥) of IC603 and pin ⑱ (pin ⑯) of IF/MTS pack.
Is signal inputted to pin ① (pin ⑪) of IC603?
NO
YES
Check between J6602 (J6601) and pin ① (pin ⑪) of IC603.
Are pins ⑫ and ⑬ of IC603 at Low level? and, are pins ⑤ and ⑥ of IC603 at High level?
NO
YES
Check between J6602 (J6601) and pin ① (pin ⑪) of IC603.
Are pins ⑫ and ⑬ of IC603 at High level? and, are pins ⑤ and ⑥ of IC603 at Low level?
NO
YES
Is signal outputted to pins ② and ③ (⑫ and ⑬) of IC603?
NO
YES
Is there AT5V at pin ④ of IC603?
NO
YES
Check AT5V line.
Is there a signal at pin ⑪ of IC601 (IC602)?
NO
YES
Check between IC603 and IC601 (IC602).
Replace IC603.
Is there PC9V at pin ㉘, ㉙ of IC601 (IC602)?
NO
YES
Check PC9V line.
Is signal outputted to pin ⑭ of IC601 (IC602)?
NO
YES
Is pin ⑪ of IC601 (IC602) at Low level?
NO
YES
Check E-E "L" line.
Is there a signal at pins ⑮ and ⑯ of IC601 (IC602)?
NO
YES
Check FL601 (FL603) and its peripheral circuits.
Is the voltage at IC601 (IC602) normal?
NO
YES
Check R612 and R613 (R642 and R643).
A
Is signal outputted to pin ⑰ of IC601 (IC602)?
NO
YES
Is pin ⑲ of IC601 (IC602) at Low level?
NO
YES
Replace IC601 (IC602).
RF Out
Line Out
Is there a signal at C680 and C681?
NO
YES
Is there a signal at pin ⑨ (pin ⑪) of IC602.
NO
YES
Check between pin ⑨ (pin ⑪) of IC602 and J6604 (J6603).
Is the base of Q607 at Low level?
NO
YES
Check between pin ⑪ of IC601 (IC602) and pin ⑨ (pin ⑪) of K602.
Check Audio mute circuit.
Is a specific signal at pin ⑬ of K602?
NO
YES
Check between pin ⑬ of K602 and RF converter and RF converter alone.
Check L,R-mixed circuit.

FLOW CHART NO. 17


RECORDING MODE
Sound can not be recorded.
Is there a signal at pin ⑳ of IC601 (IC602)?
NO
Check between pins ⑰ and ⑳ of IC601 (IC602).
YES
Is a signal outputted to pin ㉔ of IC601 (IC602)?
NO
Is at pin ㉓ of IC601 (IC602) High level?
NO
Check Bias CTL 9V line.
YES
Is a signal outputted to pin ① of FL602 (FL604)?
NO
Check between pin ㉔ of IC601 (IC602) and FL602 (IC604).
Replace IC601 (IC602).
YES
Does bias oscillator work?
NO
Check Bias oscillator circuit.
YES
Are signals outputted both from TP601 (TP603) are TP602 (TP604)?
NO
Check between BA pin ⑦ (pin ④) and BA pin ③ (pin ⑥).
YES
Check the high of A/C Head and clean it.

FLOW CHART NO. 18


PB MODE
Playback sound can not be produced.
Is there a signal at pin ④ of IC601 (IC602)?
NO
Check between A/C head and pin ④ of IC601 (IC602).
YES
Is a signal outputted from pin ⑧ of IC601 (IC602)?
NO
Check P.B EQ Amp.
YES
Is there a signal at pin ⑨ of IC601 (IC602)?
NO
Check C606 (CG36) and R609 (R639).
YES
Is a signal outputted from pin ⑭ of IC601 (IC602)?
NO
Is pin ⑲ of IC601 (IC602) at high level?
NO
Check EE low line.
YES
Check A (EE MODE)
YES
Replace IC601 (IC602).

SCHEMATIC DIAGRAM

IMPORTANT SAFETY NOTICE:

IMPORTANT SAFETY NOTICE:
BE SURE TO USE GENUINE PARTS FOR SECURING THE SAFETY AND RELIABILITY OF THE UNIT.
PARTS MARKED WITH "⚠" AND PARTS SHADED (IN BLACK) ARE ESPECIALLY IMPORTANT FOR MAINTAINING THE SAFETY AND PROTECTING ABILITY OF THE UNIT.
BE SURE TO REPLACE THEM WITH PARTS OF SPECIFIED PART NUMBER.
DISCONNECT THE AC PLUG FROM THE AC OUTLET BEFORE REPLACING PARTS.

NOTE:

1. *The unit of resistance "ohm" is omitted(K : 1000 ohms M : 1 Meg ohm)*
2. *All resistors are 1 / 8 watt. unless otherwise noted.*
3. *All capacitors μF, unless otherwise noted P : μμF.*

Voltages and waveform are measured as follows:

- *DC voltages are measured with an SSVM placed between points indicated and chassis ground, with the supply voltage of 120V AC and all controls for normal positions.*

- *The indicated voltages in the following diagram are measured with an SSVM, upon receiving color bars (400 Hz sound signal) in either the record mode or the play mode.*
  Voltage is indicated as follows:

  4.0 ··· *Record mode (SP)*

  (4.0) ··· *PB mode (SP)*

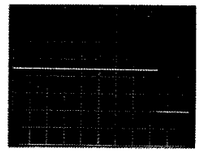
  4.0 ··· *LP mode*

  4.0 ··· *EP mode*

This circuit diagram is a standard one, actual circuits printed may be subject to change for product improvement without prior notice.

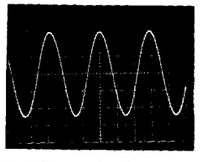
WAVE FORM

MAIN

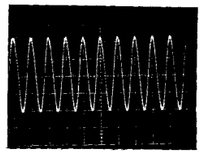


Tracking M.M.
TP702
2V, 2μsec/div

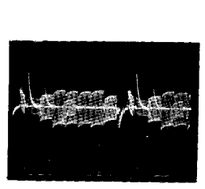
Head Switching Pulse
(Upper) TP701
1V/div
(Lower) Video Output
0.5V, 50μsec/div



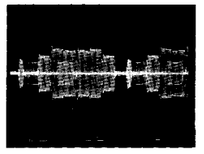
Full Erase Head
Between BB Pin ③ and ④
10V, 5μsec/div



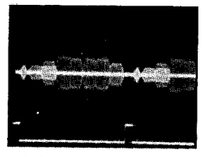
Audio PB Signal
K602 Pin ⑨ L-ch, Pin ⑪
R-ch
0.2V, 1msec/div



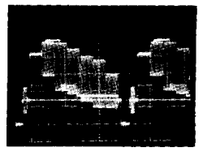
REC Chrominance Signal
IC501 Pin ⑱
200mV, 10μsec/div



REC Chrominance Signal
CA Pin ①
100mV, 10μsec/div

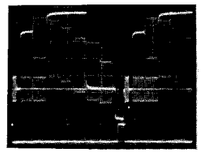


PB Chrominance Signal
IC501 Pin ㉒
50mV, 10μsec/div



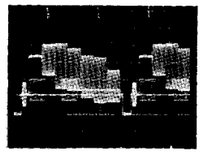
REC Video Signal
IC201 Pin ㉛
200mV, 10μsec/div

Y/C AUDIO

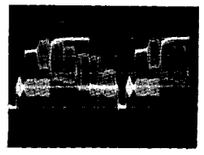


REC Video Signal
(Upper) IC201 Pin ㉗
200mV/div
Composite Sync.
(Lower) IC201 Pin ①
5V, 10μsec/div

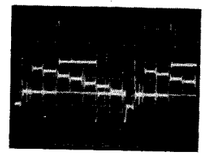
PB Chrominance Signal
(Upper) CA Pin ⑦
100mV/div
Head Switching Pulse
(Lower) CA Pin ⑤
2V, 10msec/div



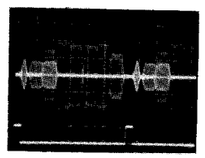
EE Signal
IC201 Pin ㉖
500mV, 10μsec/div



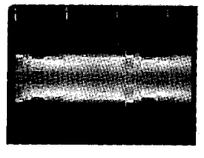
PB Signal
IC201 Pin ㉖
500mV, 10μsec/div



White Clip
TP203
200 ~ 500mV,
10 ~ 20μsec/div
(TP201: Trigger)

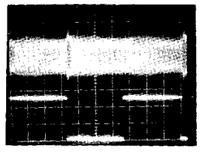


PB Chrominance Signal
IC501 Pin ㉚
50mV, 10μsec/div

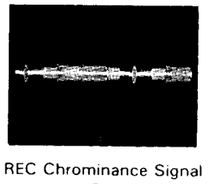


REC Signal
TP301 (TP302: GND)
50mV, 10μsec/div
(TP201: Trigger)

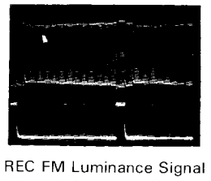
HEAD AMP



PB Luminance Signal
(Upper) IC301 Pin ①
50mV/div
Head Switching Pulse
(Lower) XA Pin ⑤
2V, 10msec/div



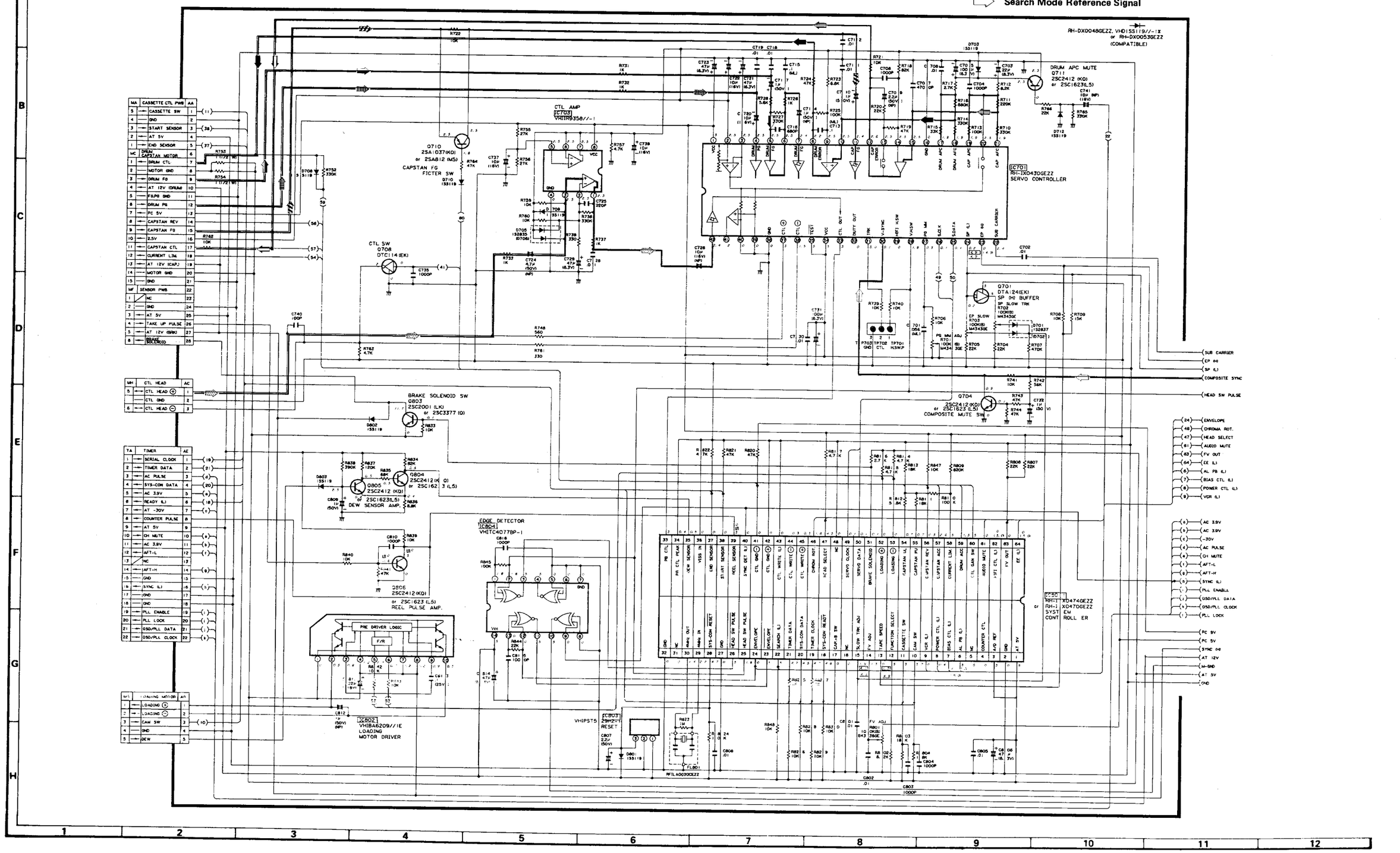
REC Chrominance Signal
IC301 Pin ㉒
50mV, 10μsec/div



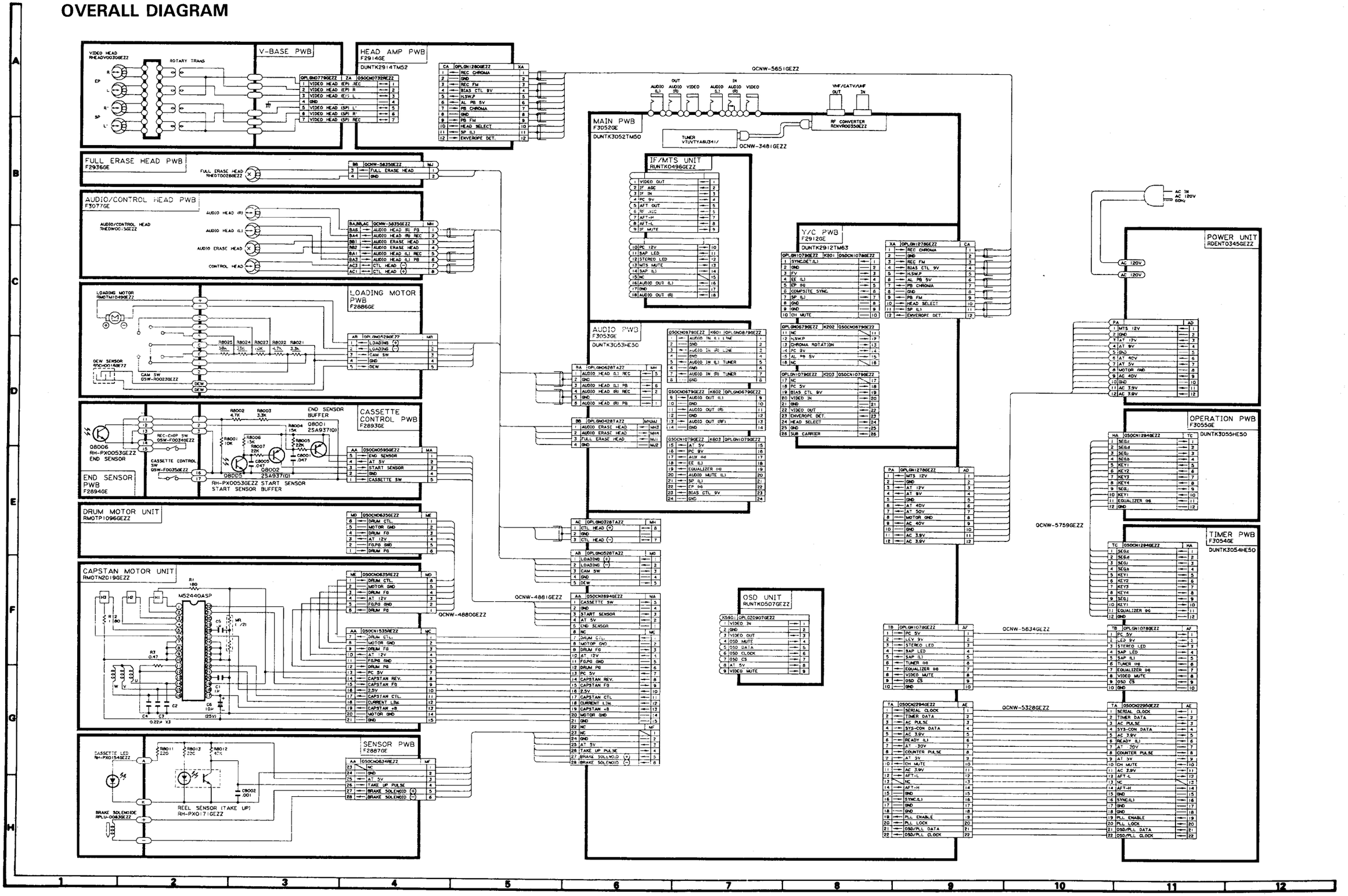
REC FM Luminance Signal
(Upper) IC301 Pin ㉑
50mV/div
Composite Sync.
(Lower) IC201 Pin ①
2V, 10μsec/div

MAIN (1) (SERVO, SYSTEM CONTROL, IF, OSD) CIRCUIT

Drum Control Signal
Drum Frequency Reference Signal
Drum Phase Reference Signal
Capstan Control Signal
Capstan Frequency Reference Signal
Capstan Phase Reference Signal(PB)
Search Mode Reference Signal

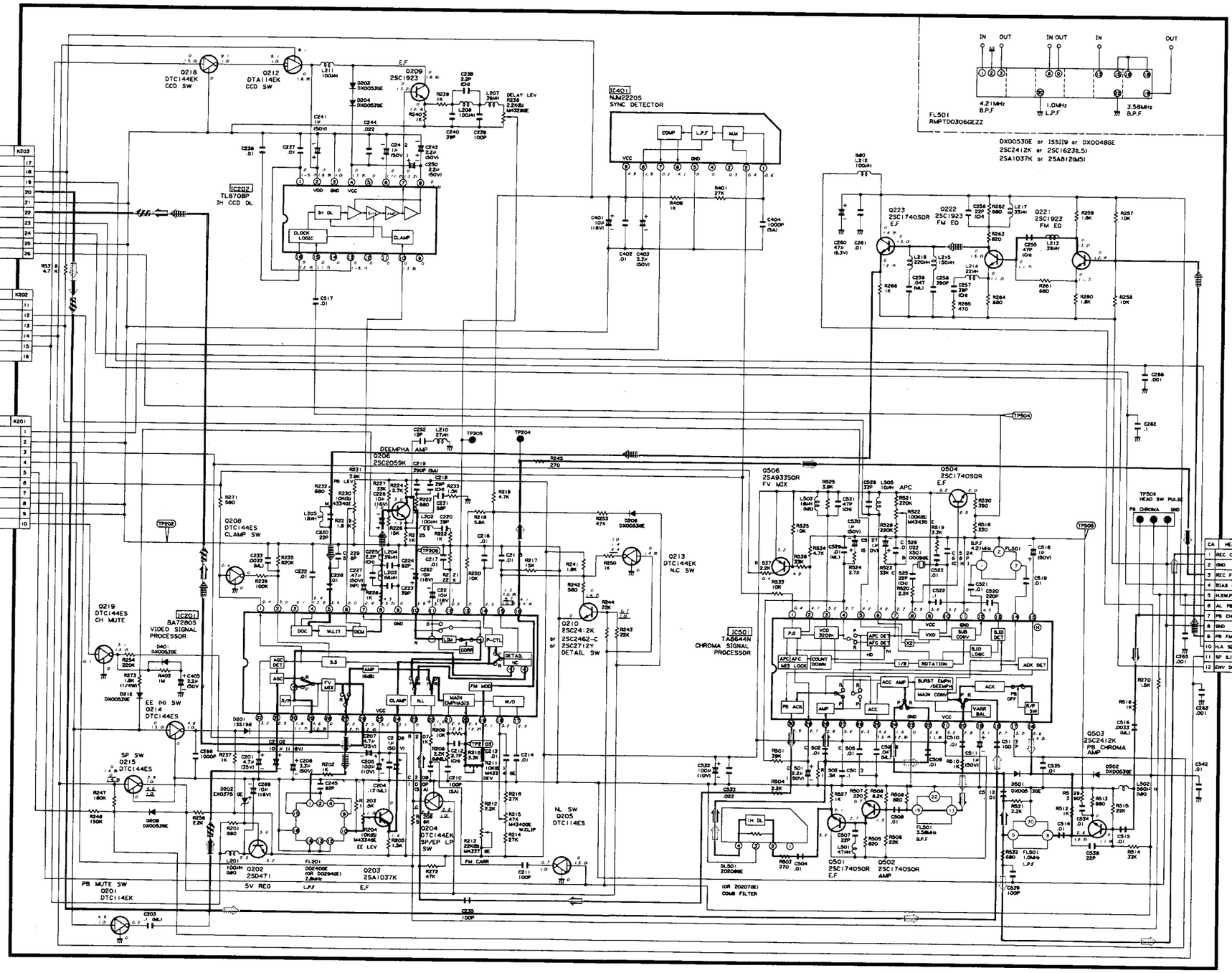


OVERALL DIAGRAM



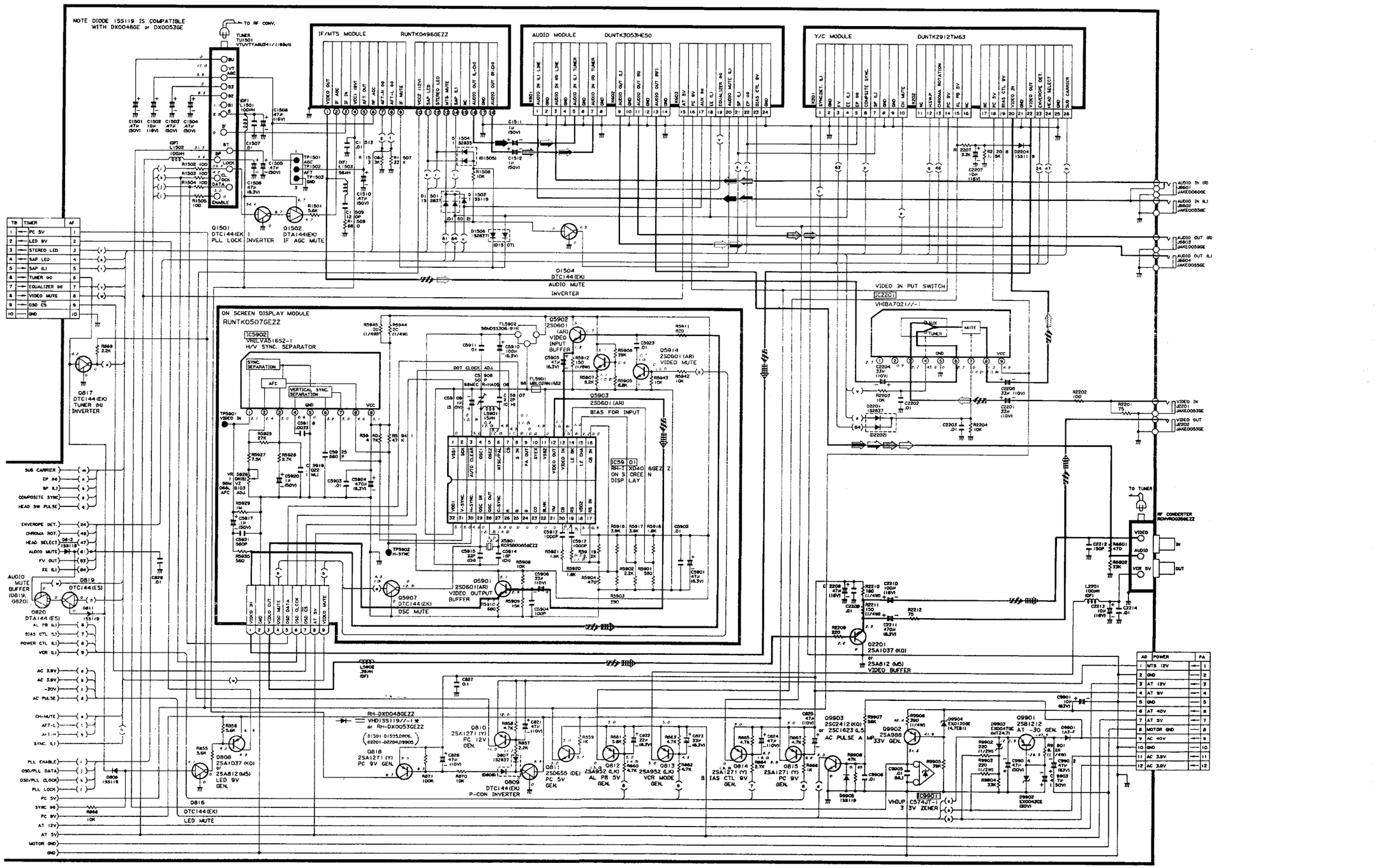
Y/C CIRCUIT

Playback Luminance Signal
Playback Chrominance Signal
E-E Signal
Record Luminance Signal
Record Chrominance Signal

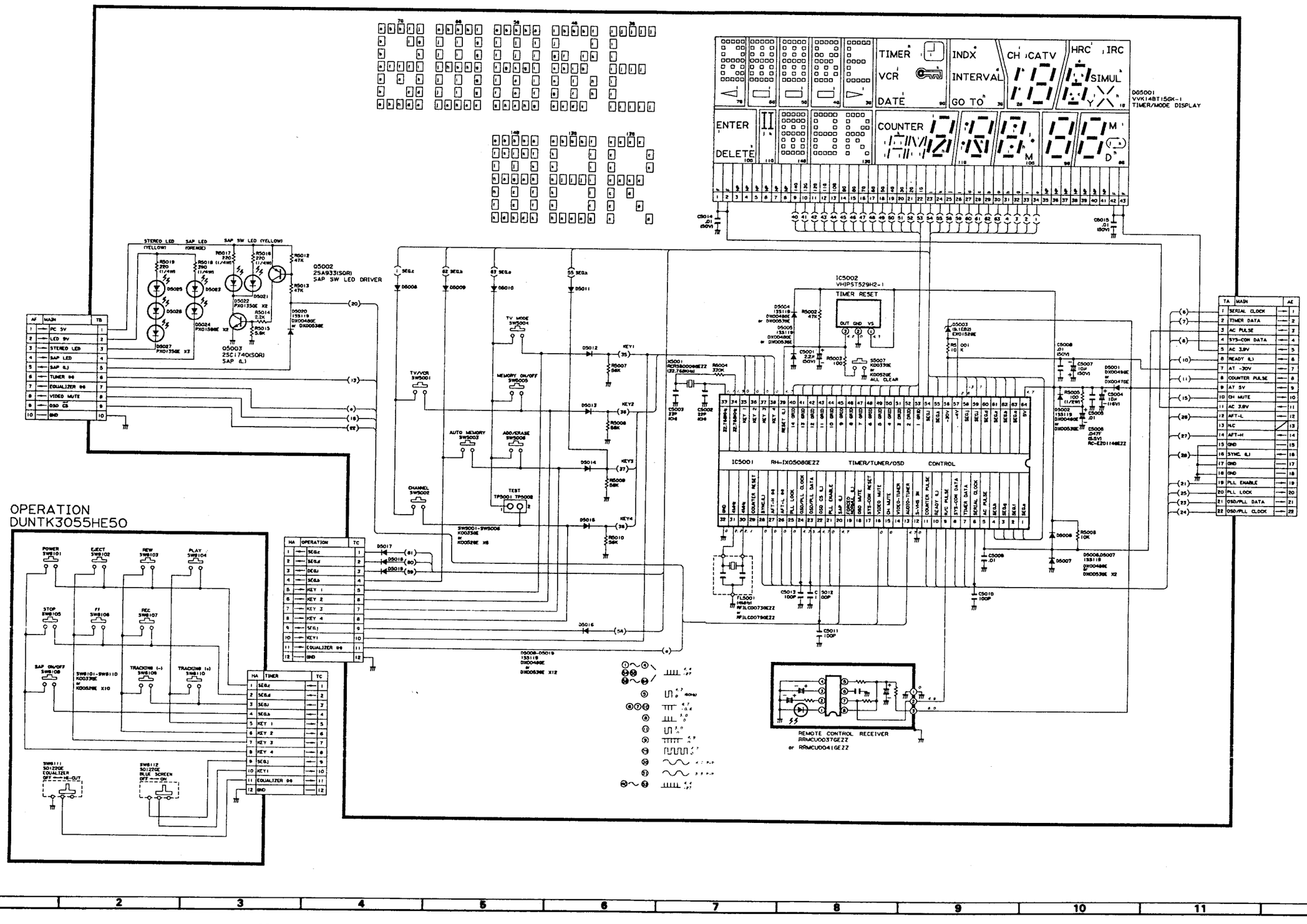


MAIN (2) (SERVO, SYSTEM CONTROL, IF, OSD) CIRCUIT

Video PB
Video REC
Video EE
Audio EE (R)
Audio EE (L)
Audio REC (R)
Audio REC (L)
Audio PB (R)
Audio PB (L)

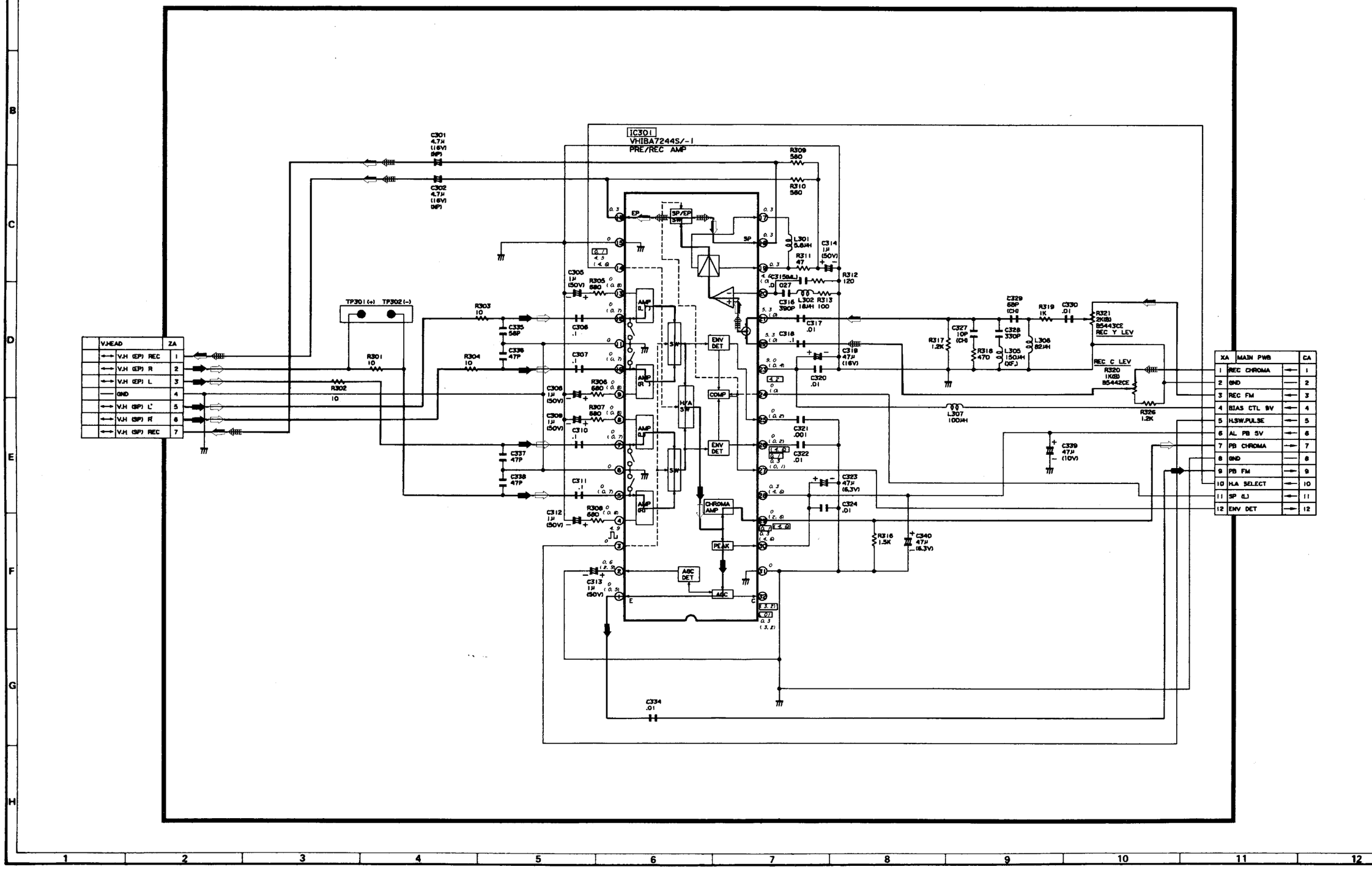


TIMER, OPERATION CIRCUITS



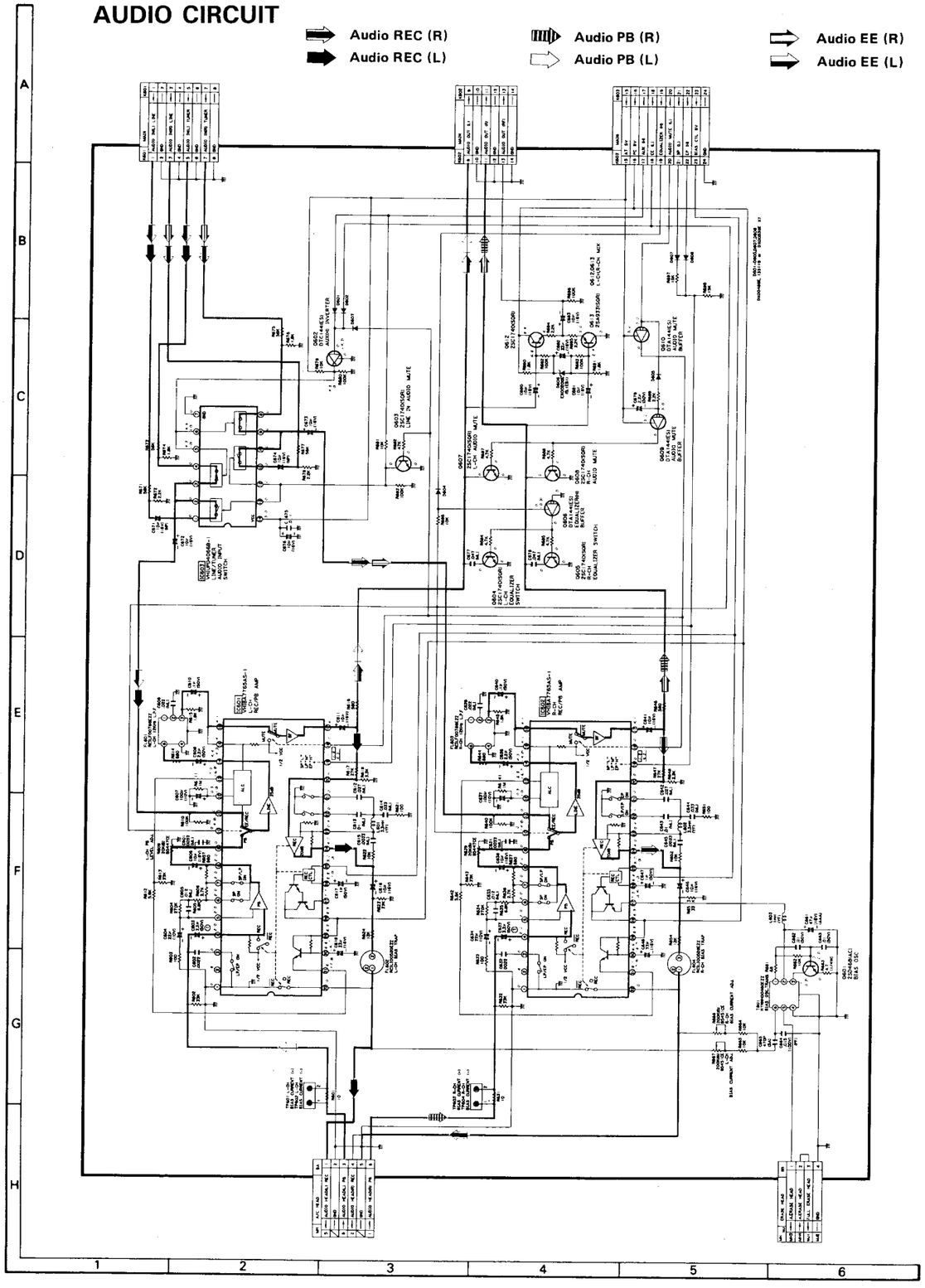
HEAD AMP CIRCUIT

Playback Luminance Signal
Playback Chrominance Signal
Record Luminance Signal
Record Chrominance Signal

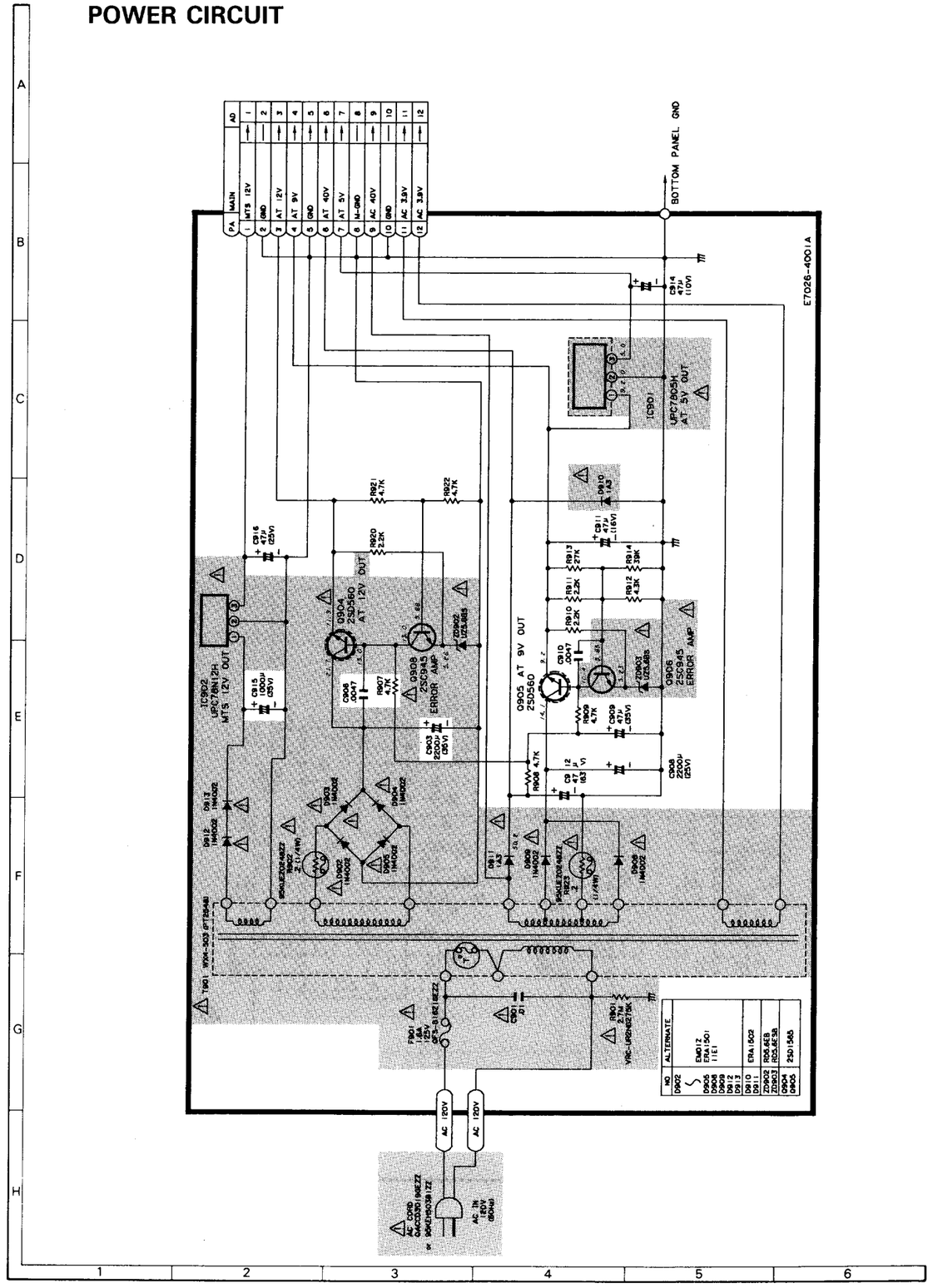


AUDIO CIRCUIT

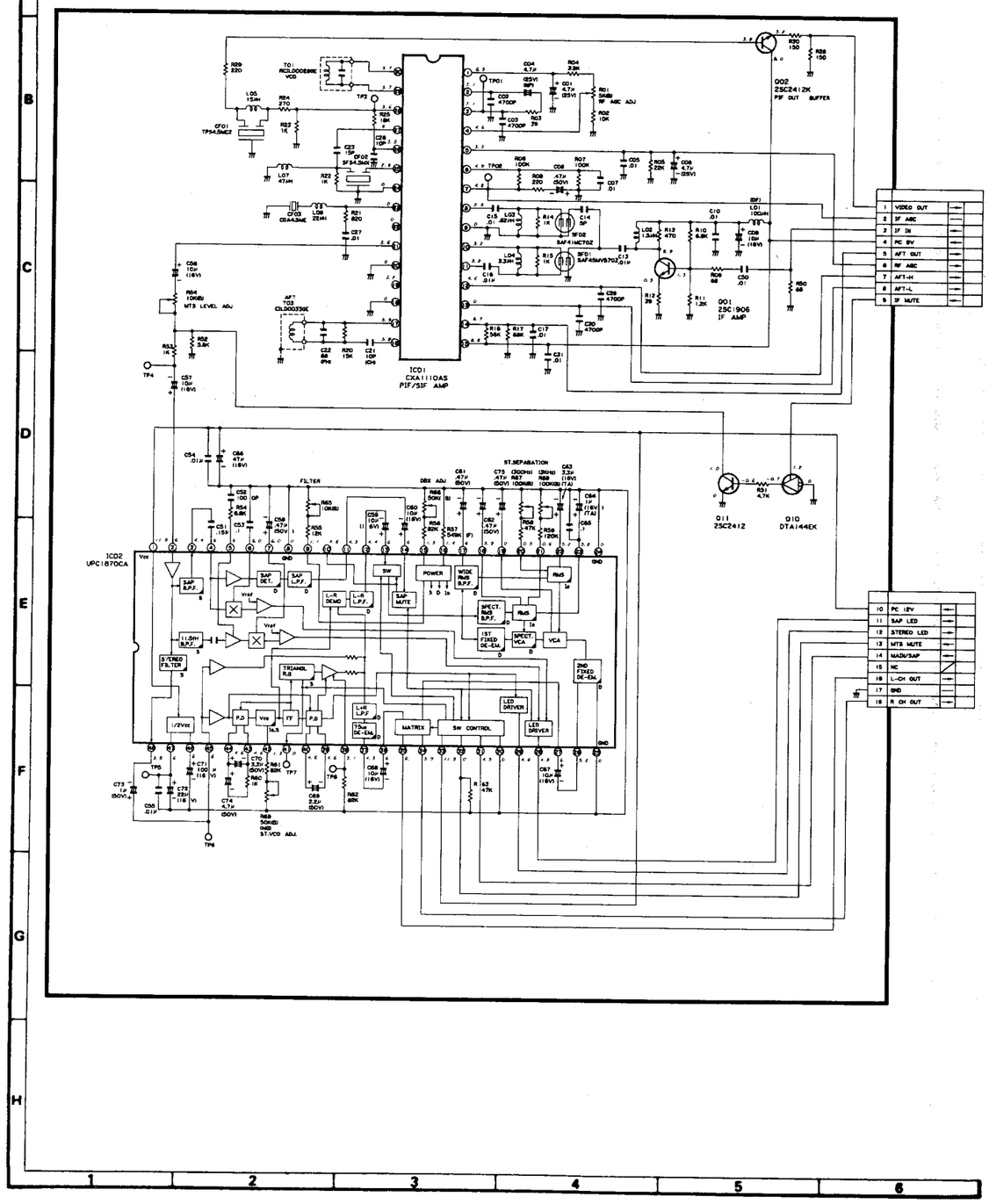
Audio REC (R)
Audio REC (L)
Audio PB (R)
Audio PB (L)
Audio EE (R)
Audio EE (L)



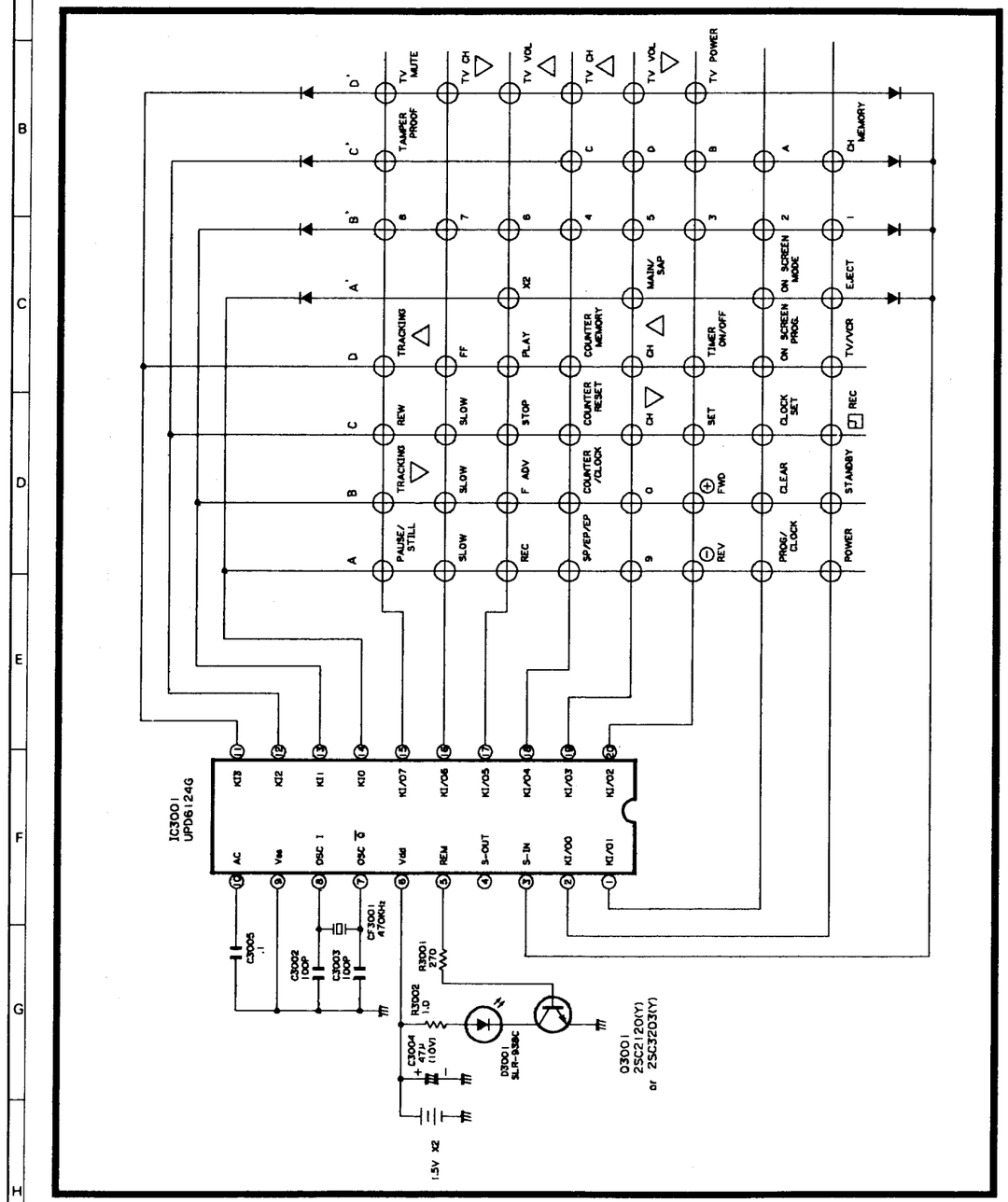
POWER CIRCUIT

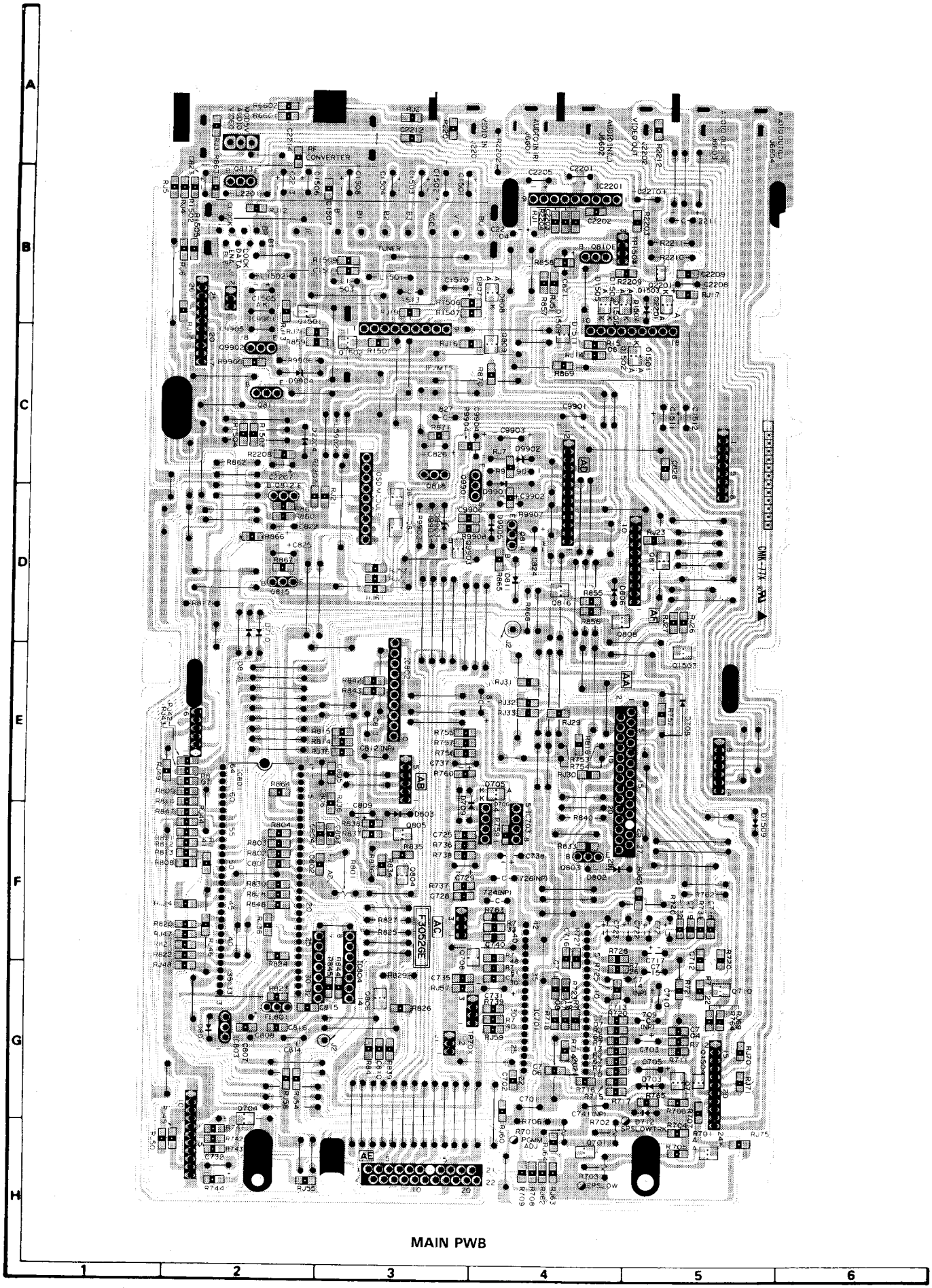


IF/MTS CIRCUIT

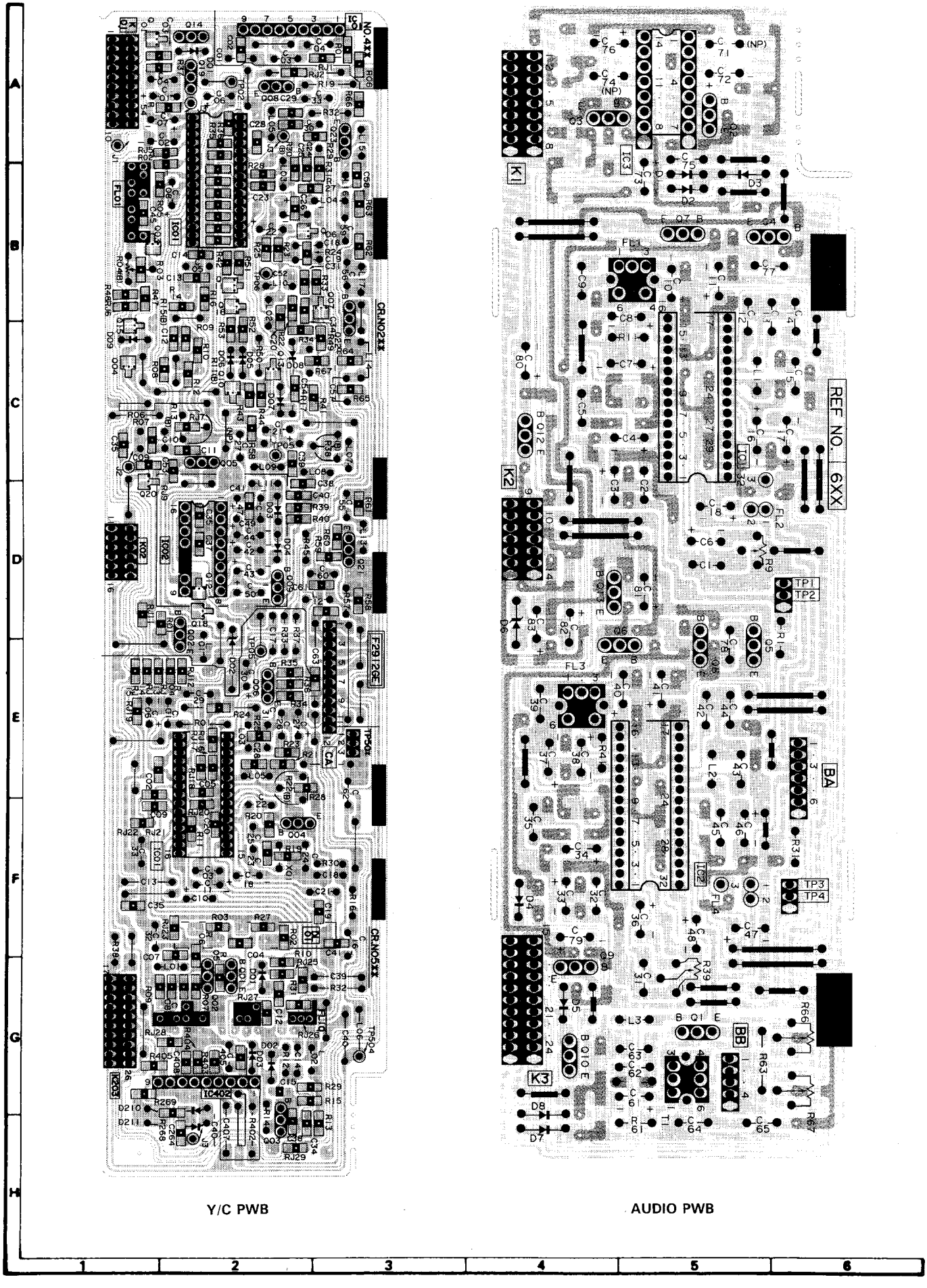


INFRARED REMOTE CONTROL CIRCUIT



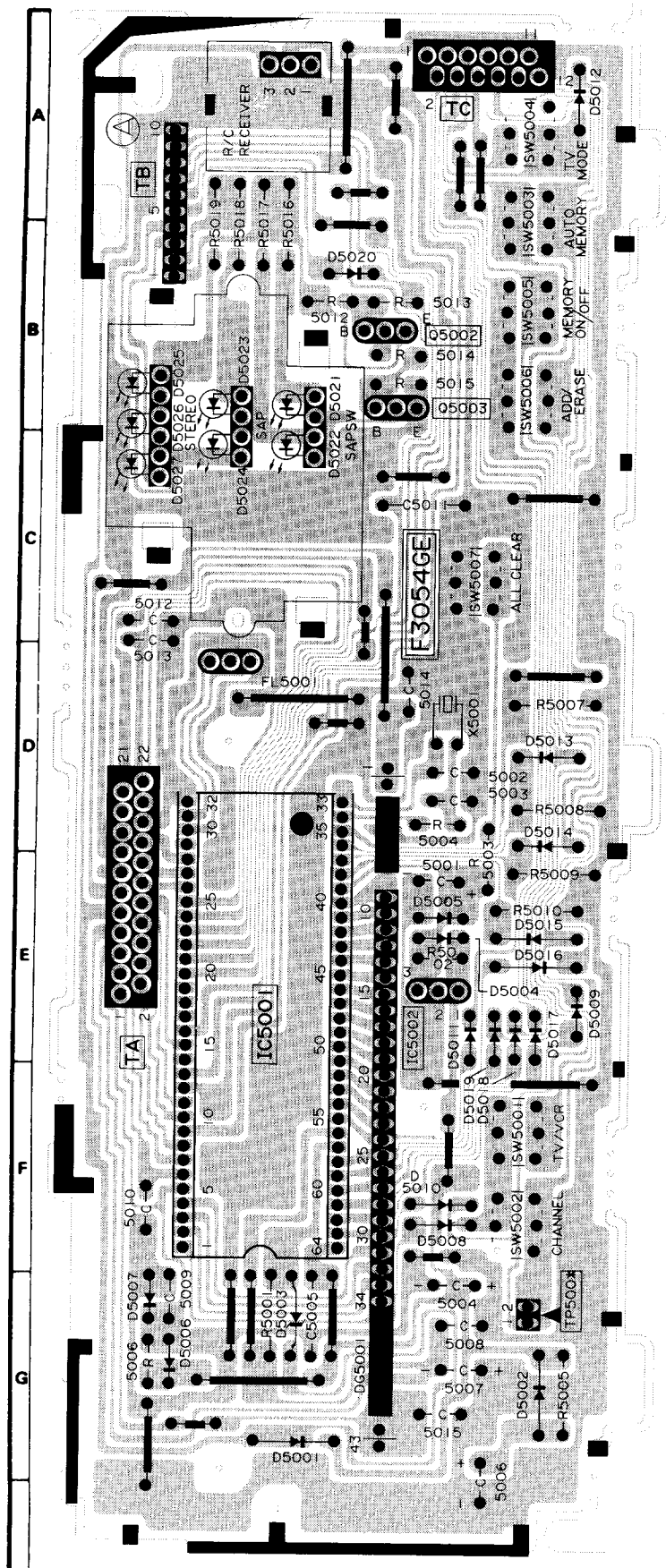

A
B
C
D
E
F
G
H
1
2
3
4
5
6
RF CONVERTER
TUNER
IC2201
F30526E
IC701
IC804
VC-M705U

MAIN PWB

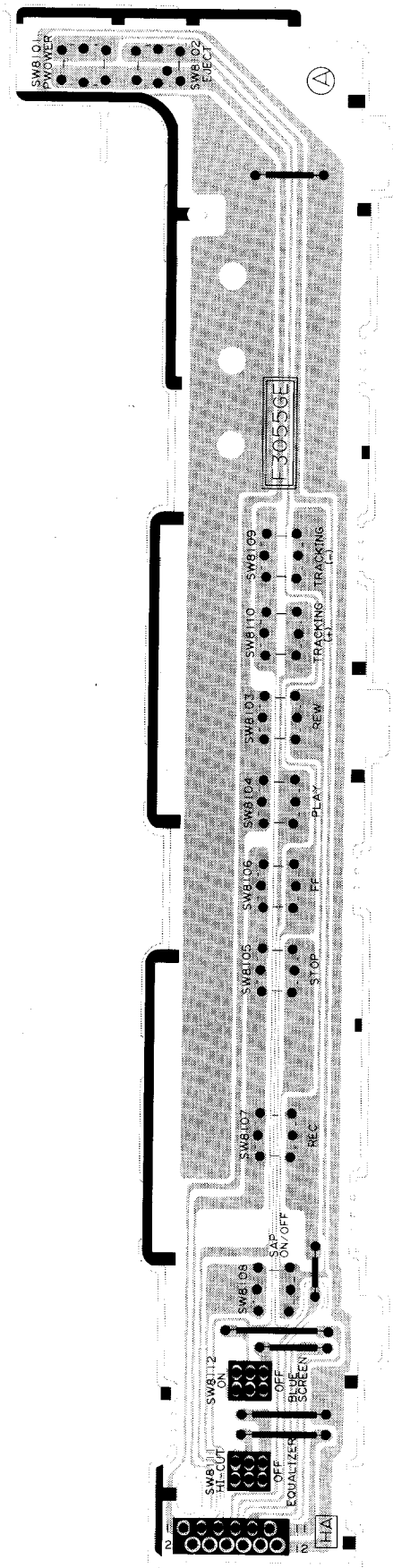


Y/C PWB

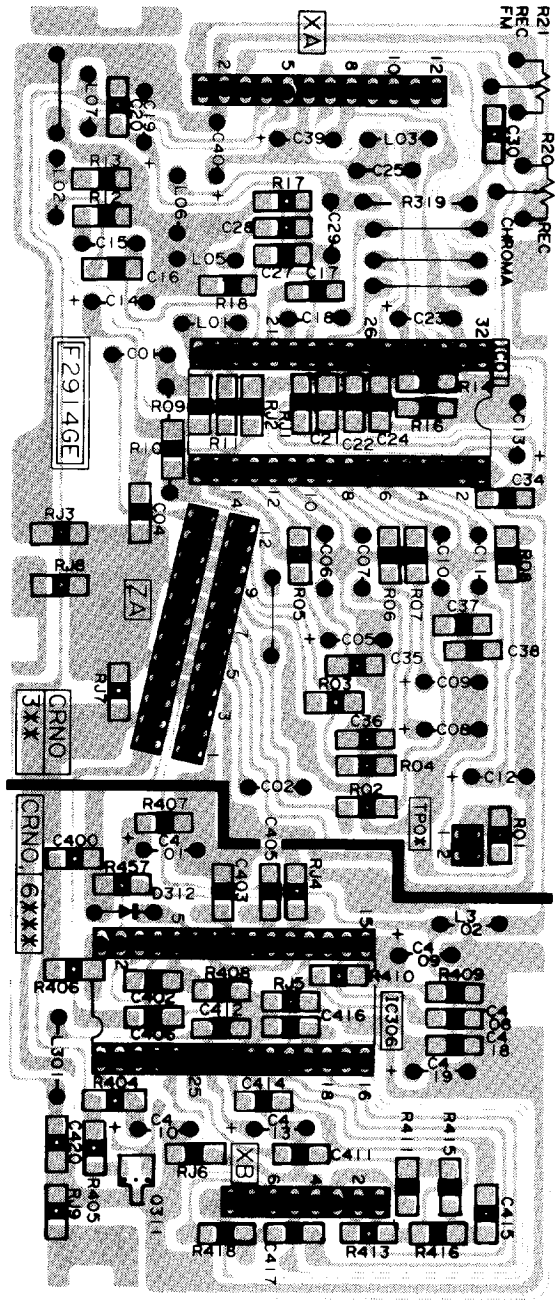
AUDIO PWB



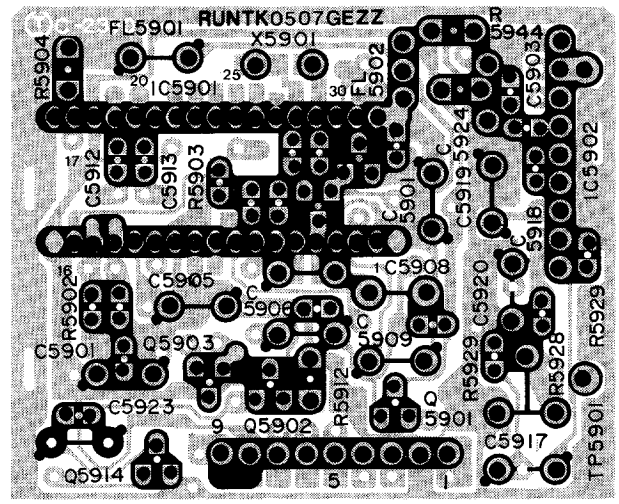
TIMER PWB



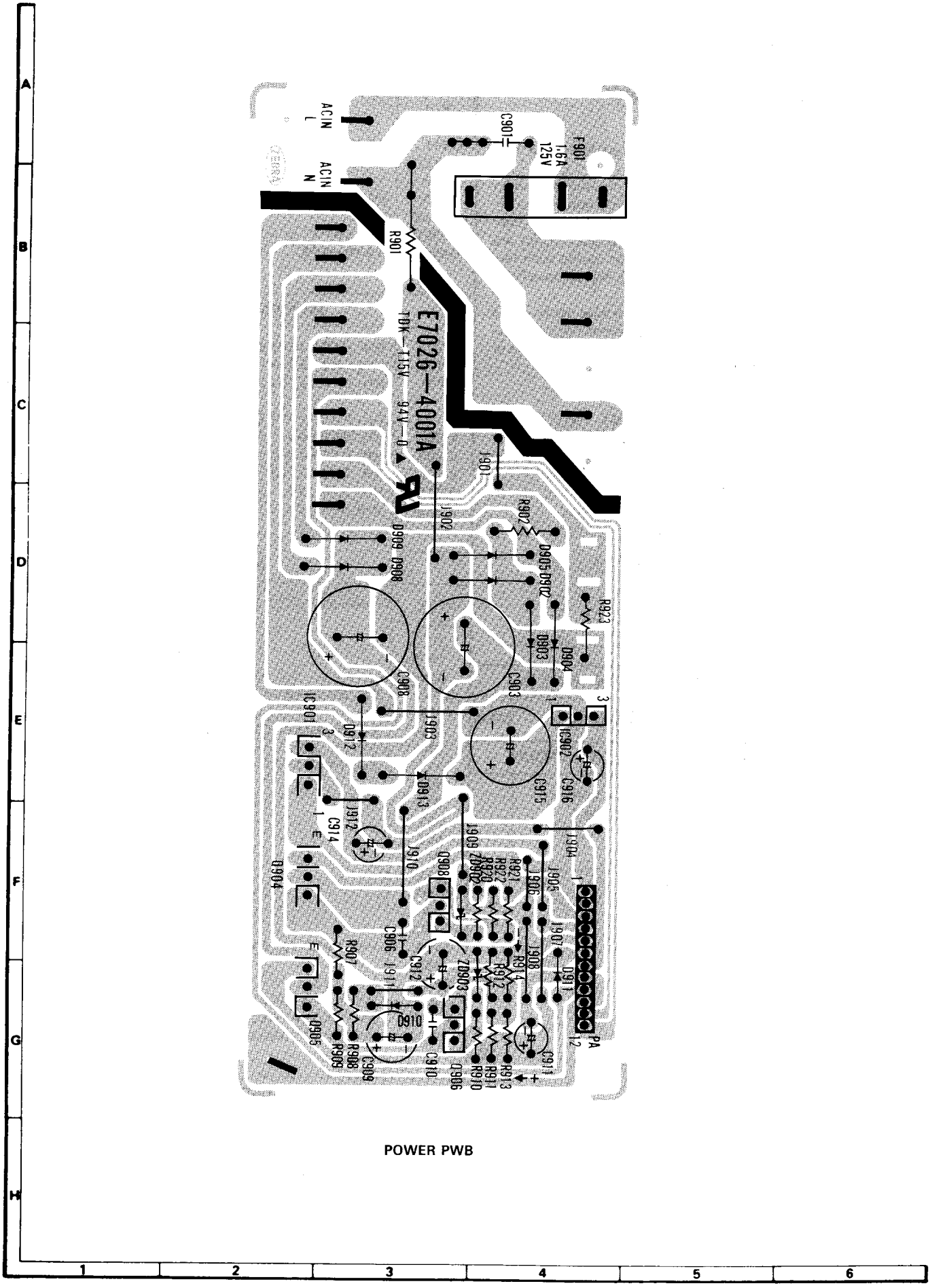
OPERATION PWB



HEAD MAP PWB



ON SCREEN DISPLAY PWB


A
B
C
D
E
F
G
H
1
2
3
4
5
6
AC IN
L
AC IN
N
F901
1.6A
125V
C901
R901
E7026—4001A
TDK—115V 94V—0
J901
J902
R902
D905
D902
D903
D904
R923
C903
C908
C901
D912
J903
D913
C914
J912
J910
D908
D909
D906
C915
C916
IC902
J904
J905
J907
J908
D911
C911
PA
12
R914
R912
R913
R911
R910
C909
C910
C912
Z902
D910
R907
R908
R909
D907
C906
J911
D901
D904

POWER PWB

REPLACEMENT PARTS LIST

PARTS REPLACEMENT

Many electrical and mechanical parts in video cassette recorder have special safety-related characteristics.
These characteristics are often not evident from visual inspection nor can be protection afforded by them necessarily obtained by using replacement components rated for higher voltage, wattage, etc.
Replacement parts which have special safety characteristics are identified in this manual, electrical components having such features are identified by ⚠ and shaded areas in the Replacement Parts Lists and Schematic Diagrams.
The use of a substitute replacement part which does not have the same safety characteristics as the factory recommended replacement parts shown in this service manual may create shock, fire or other hazards.

"HOW TO ORDER REPLACEMENT PARTS"

To have your order filled promptly and correctly, please furnish the following informations.

1. MODEL NUMBER
2. REF. NO.
3. PART NO.
4. DESCRIPTION
5. CODE

Contact your nearest SHARP Parts Distributor to order.

For location of SHARP Parts Distributor,
Please call Toll-Free;
800-447-4700
(In Hawaii and Alaska, please contact local SHARP dealer.)

PWB ASSEMBLY IS NOT REPLACEMENT ITEM

REF. NO.	PART NO.	DESCRIPTION	CODE
MAIN (SERVO, SYSTEM-CONTROL, IF) CIRCUIT			
	DUNTK3052TM50	Main (Servo, System Control, IF) Board Assembly	—
TRANSISTORS			
Q701	VSDTA124EK/-1	DTA124EK	AB
Q704, 711,	VS2SC2412KQ-1 or	2SC2412KQ	AA
804, 805, 806, 9903	VS2SC1623L51E	2SC1623	AB
Q708	VSDTC114EK/-1	DTC114EK	AB
Q710, 808,	VS2SA1037KQ-1 or	2SA1037	AA
2201	VS2SA812-M51E	2SA812	AC
Q803	VS2SC2001LK-1 or	2SC2001LK	AA
	VS2SC3377-Q-1	2SC3377Q	AC
Q809, 816, 817, 819, 1501, 1504	VSDTC144EK/-1	DTC144EK	AB
Q810, 814, 815, 818	VS2SA1271-Y-1	2SA1271	AB
Q811	VS2SD655-DE1E	2SD655	AC
Q812, 813	VS2SA952LK/-1	2SA952	AB
Q820, 1502	VSDTA144EK/-1	DTA144EK	AC
Q9901	VS2SB1212//1E	2SB1212	AC
Q9902	VS2SA988///1E	2SA988	AB
INTEGRATED CIRCUITS			
IC701	RH-iX0430GEZZ	iX0430GE	AS
IC703	VHiR9358//-1		AD
IC801	RH-iX0474GEZZ or	iX0474GE	AW
	RH-iX0470GEZZ		AW
IC802	VHiBA6209//1E		AG
IC803	VHiPST529H2-1		AD
IC804	VHiTC4077BP-1		AD
IC2201	VHiBA7021//-1		AE
IC9901	VHiUPC574JT-1		AC
DIODES			
D701, 807, 1501, 1506, 2201	VHD1S2837//1E	1S2837	AC
D703, 708,	RH-DX0048GEZZ or		AA
709, 710,	RH-DX0053GEZZ or		AA
712, 801, 802, 803, 806, 811, 812, 1503, 2204, 9905	VHD1SS119//-1	1SS119	AB
D705, 1504	VHD1S2835//1E	1S2835	AC
D9901	VHD1A3-F///-1		AA
D9902	RH-EX0043CEZZ	HZ30	AB
D9903	RH-EX0047GEZZ	MTZ4.7	AA
D9904	RH-EX0130GEZZ	HZS4.7EB1	AA
CONTROLS			
R701,	RVR-M4343GEZZ	100k(B) Phase Generator MM Adj.	AB
702,		100k(B) SP Slow Tracking Adj.	
703		100k(B) EP Slow Tracking Adj.	
R801	RVR-B4336GEZZ	100k(B) False Vertical Sync Adj.	AD

REF. NO.	PART NO.	DESCRIPTION	CODE
COILS AND FILTER			
L1501, 1502, 2201	VP-DF101K0000	100μH	AB
L1503	VP-XF560K0000	56μH	AB
L5902	VP-DFR39M0000	0.39μH	AB
FL801	RFiLA0030CEZZ		AD
CAPACITORS			
C705, 731	VCEAEA0JW107M	100μF, 6.3V, 20%, Electrolytic	AB
C709	VCE9EA1HW225M	2.2μF, 50V, 20%, Electrolytic (N.P.)	AB
C714, 812	VCE9EA1HW105M	1μF, 50V, 20%, Electrolytic (N.P.)	AC
C724	VCE9EA1HW475M	4.7μF, 50V, 20%, Electrolytic (N.P.)	AD
C726, 741	VCE9EA1CW106M	10μF, 16V, 20%, Electrolytic (N.P.)	AC
C2210	VCEAEA1CW107M	100μF, 16V, 20%, Electrolytic	AC
C2211	VCEADA0JW477M	470μF, 6.3V, 20%, Electrolytic	AB
C9905	RC-QZA103TAYJ	0.01, Mylar	AB
MISCELLANEOUS			
	RCNVR0035GEZZ	RF Converter	AW
	VTUVTYA6U341/	Tuner	BL
	RUNTK0496GEZZ	IF/MTS Unit	BH
	RUNTK0507GEZZ	OSD Unit	BA
J2201, 2202	QJAKE0053GEZZ	Jack, Video Input Jack, Video Output	AD
J6601	QJAKE0060GEZZ	Jack, Audio Input (R)	AC
J6602, 6604	QJAKE0055GEZZ	Jack, Audio Input (L) Jack, Audio Output (L)	AD
J6603	QJAKE0059GEZZ	Jack, Audio Output (R)	AC
	QPLGN0328TAZZ	Plug, 3 pin (TP701—703, TP1501—1503, AC)	AD
	QPLGN0528TAZZ	Plug, 5 pin (AB)	AB
	QPLGN0679GEZZ	Plug, 6 pin (K202, K602)	AB
	QPLGN0879GEZZ	Plug, 8 pin (K601)	AB
	QPLGN1078GEZZ	Plug, 10 pin (AF)	AC
	QPLGN1079GEZZ	Plug, 10 pin (K201, K203, K603)	AB
	QPLGN1278GEZZ	Plug, 12 pin (AD)	AC
	QSöCN2294GEZZ	Socket, 22 pin (AE)	AD
	QSöCN2894GEZZ	Socket, 28 pin (AA)	AD
OSD CIRCUIT			
	RUNTK0507GEZZ	OSD Board Assembly	—
TRANSISTORS			
Q5901 | 5903, 5914	98M2SD601A/ / /	2SD601AR	AB
	or		
	VS2SC2412KQ-1	2SC2412KQ	AA
	or		
	VS2SC1623L51E	2SC1623	AB

REF. NO.	PART NO.	DESCRIPTION	CODE
Q5907	98MDTC144EK/ /	DTC144EK	AB
	or		
	VSDTC144EK/ - 1	DTC144EK	AB
INTEGRATED CIRCUITS			
IC5901	RH-iX0406GEZZ	iX0406GE	AV
IC5902	VHiLVA516S2-1		AH
CRYSTAL			
X5901	RCRSB0085GEZZ	Crystal (14.32MHz)	AG
TRIMMER			
C5908	98MECR-HA050G	Trimmer Capacitor	AC
CONTROL			
VR5928	98MVZ066LB103	10k(B) AFC Adj.	AC
	or		
	RVR-M4343GEZZ		AB
COIL AND FILTERS			
L5901	98M0405RA150K	15μH	AC
FB5901	98MBL02RN1R62	RF Filter	AC
FL5902	98MDSS306-91F	RF Filter	AC
	or		
	RFiLN0013CEZZ		AC
CAPACITORS			
C5910	98MA0JU101B/ /	100μF, 6.3V, 20%, Electrolytic	AB
	or		
	VCEAAA0JW107M		AB
C5924	98MA0JU471B/ /	470μF, 6.3V, 20%, Electrolytic	AC
	or		
	VCEAGA0JW477M		AB
Y/C CIRCUIT			
	DUNTK2912TM63	Y/C Board Assembly	—
TRANSISTORS			
Q201	VSDTC114EK/ - 1	DTC114EK	AB
Q202	VS2SD471-KL1E	2SD471	AC
Q203	VS2SA1037KQ-1	2SA1037KQ	AA
	or		
	VS2SA812-M51E	2SA812M5	AC
Q204, 213, 218	VSDTC144EK/ - 1	DTC144EK	AB
Q205	VSDTC114ES/ - 1	DTC114ES	AB
Q206	VS2SC2059KN1E	2SC2059K	AC

REF. NO.	PART NO.	DESCRIPTION	CODE
Q208, 214, 215, 219	VSDTC144ES/-1	DTC144ES	AB
Q209, 221, 222	VS2SC1923-ō1E	2SC1923	AD
Q210, 503	VS2SC2412KQ-1 or VS2SC1623L51E	2SC2412K 2SC1623	AA AB
Q212	VSDTA114EK/-1	DTA114EK	AB
Q223, 501, 502, 504	VS2C1740SQR1E	2SC1740SQR	AC
Q506	VS2SA933SQR1E	2SA933SQR	AB
INTEGRATED CIRCUITS			
IC201	VHi BA7280S/-1	Y-Process	AR
IC202	VHi TL8708P/-1	1H CCD	AK
IC401	VHi NJM2220S-1	Sync Detector	AG
IC501	VHi TA8644N/-1	C-Process	AP
DIODES AND CRYSTAL			
D201	VHD1SS198//-1	1SS198	AB
D202	RH-EX0375GEZZ		AA
D203, 204, 206, 209, 212, 401, 501, 502	RH-DX0048GEZZ or VHD1SS119//-1 or RH-DX0053GEZZ	1SS119	AA AB AA
X501	RCRSB0009GEZZ	Crystal (3.58MHz)	AL
CONTROLS			
R204, 211, 230	RVR-M4334GEZZ	10k(B) E-E Level 10k(B) Deviation 10k(B) Playback Level	AB
R213	RVR-M4337GEZZ	22k(B) FM Carrier	AB
R215	RVR-M4340GEZZ	47k(B) White Clip	AB
R238	RVR-M4328GEZZ	2.2k(B) Delay Level	AB
R522	RVR-M4343GEZZ	100k(B) APC	AB
COILS AND FILTERS			
L201, 212	VP-MK101K0000	100μH	AB
L202, 208, 211	VP-XF101K0000	100μH	AB
L203	VP-XF680K0000	68μH	AB
L204, 207, 213	VP-XF390K0000	39μH	AB
L205	VP-XF180K0000	18μH	AB
L214	VP-XF220K0000	22μH	AB
L215	VP-XF151K0000	150μH	AB
L216	VP-XF221K0000	220μH	AB
L217	VP-XF330K0000	33μH	AB
L501	VP-XF470K0000	47μH	AB
L502	VP-MK561K0000	560μH	AB
L503	VP-MK180J0000	18μH	AB
L505	VP-XF100K0000	10μH	AB
FL201	RMPTD0240GEZZ	Filter	AK
FL501	RMPTD0306GEZZ	Filter	AG
DL501	RCiLZ0207GEZZ or RCiLZ0208GEZZ	1H Delay Line 1H Delay Line	AQ AN
CAPACITORS			
C205	VCEAEA1AW107M	100μF, 10V, 20%, Electrolytic	AB
C227	VCE9AA1HW474M	0.47μF, 50V, 20%, Electrolytic (N.P.)	AC
C233, 516	RC-QZA332TAYJ	0.0033μF, Mylar	AB
C262, 503, 522	RC-KZ0011GEZZ	0.1μF, Ceramic	AA
C529	RC-QZA103TAYJ	0.01μF, Mylar	AB
C532	VCEAGA1AW107M	100μF, 10V, 20%, Electrolytic	AB
MISCELLANEOUS			
	QPLGN0329TAZZ	Plug, 3 Pin (TP501—503)	AB
	QPLGN1278GEZZ	Plug, 12 Pin (CA)	AC
	QSōCN0679GEZZ	Socket, 5 Pin (K202)	AC
	QSōCN1079GEZZ	Socket, 10 Pin (K201, K203)	AC
HEAD AMP CIRCUIT			
	DUNTK2914TM52	Head Amp. Board Assembly	—
INTEGRATED CIRCUIT			
IC301	VHi BA7244S/-1		AM
CONTROLS			
R320	RVR-B5442CEZZ	1k(B) Record Chroma Level	AB
R321	RVR-B5443CEZZ	2k(B) Record FM Level	AB
COILS			
L301	VP-XF5R6K0000	5.6μH	AB
L302	VP-XF180K0000	18μH	AB
L305	VP-XF151K0000	150μH	AB
L306	VP-XF820K0000	82μH	AB
L307	VP-MK101K0000	100μH	AB

REF. NO.	PART NO.	DESCRIPTION	CODE
CAPACITORS			
C301, 302	VCE9EA1CW475M	4.7μF, 16V, 20%, Electrolytic (N.P.)	AB
C306, 307, 310, 311, 318	RC-KZ0011GEZZ	0.1μF, Ceramic	AA
C315	RC-QZA272TAYJ	0.0027μF, Mylar	AB
MISCELLANEOUS			
	QPLGN0229TAZZ	Plug, 2 Pin (TP301—TP302)	AB
	QPLGN1280GEZZ	Plug, 12 Pin (XA)	AC
	QSōCN0732REZZ	Socket, 7 Pin (ZA)	AC
OPERATION CIRCUIT			
	DUNTK3055HE50	Operation Board Assembly	—
MISCELLANEOUS			
	QSōCN1294GEZZ	Socket, 12 pin (HA)	AC
SW8101, 8102, 8103, 8104, 8105, 8106, 8107, 8108, 8109, 8110	QSW-K0033GEZZ or QSW-K0052GEZZ	Switch, Power Switch, Eject Switch, Rewind Switch, Play Switch, Stop Switch, Fast Forward Switch, Record Switch, SAP ON/OFF Switch, Tracking (−) Switch, Tracking (+)	AB AB
S8111, 8112	QSW-S0122GEZZ	Switch, Equalizer Switch, Blue Screen ON/OFF	AD
TIMER CIRCUIT			
	DUNTK3054HE50	Timer Board Assembly	—
TRANSISTORS			
Q5002	VS2SA933SQR1E	2SA933SQR	AB
Q5003	VS2C1740SQR1E	2SC1740SQR	AC
INTEGRATED CIRCUITS			
IC5001	RH-iX0508GEZZ	iX0508GE	AW
IC5002	VHiPST529H2-1	T529H	AD
DIODES AND CRYSTAL			
D5001	RH-DX0049GEZZ or RH-DX0047GEZZ		AC AA
D5002, 5004 — 5020	RH-DX0048GEZZ or RH-DX0053GEZZ or VHD1SS119//-1		AA AA AB
D5003	RH-EX0152GEZZ	HZS9.1EB2	AA
D5021, 5022, 5025, 5026, 5027	RH-PX0135GEZZ	LED	AC
D5023, 5024	RH-PX0159GEZZ	LED	AB
X5001	RCRSB0006GEZZ	Crystal	AK
FILTER			
FL5001	RFiLC0073GEZZ or RFiLC0079GEZZ	4MHz, Filter	AD AD
CAPACITOR			
C5006	RC-EZ0114GEZZ	0.047F, 5.5V, Electrolytic	AG
MISCELLANEOUS			
DG5001	VVK14BT15GK-1	Fluorescent Display Tube	AX
	RRMCU0037GEZZ or RRMCU0041GEZZ	R/C Receiver	AL AM
	QPLGN0228TAZZ	Plug, 2 pin (TP5001—5002)	AB
	QPLGN1078GEZZ	Plug, 10 pin (TB)	AC
	QSōCN1294GEZZ	Socket, 12 pin (TC)	AC
	QSōCN2295GEZZ	Socket, 22 pin (TA)	AD
SW5001, 5002, 5003, 5004, 5005, 5006, 5007	QSW-K0033GEZZ or QSW-K0052GEZZ	Switch, TV/VCR Switch, Channel Switch, Auto Memory Switch, TV Mode Switch, Memory ON/OFF Switch, Add/Erase Switch, All Clear	AB AB
AUDIO CIRCUIT			
	DUNTK3053HE50	Audio Board Assembly	—
TRANSISTORS			
Q601	VS2SD468-C/-1	2SD468	AD
Q602	VSDTC144ES/-1	DTC144ES	AB
Q603, 604, 605, 607, 608, 612	VS2C1740SQR1E	2SC1740SQR	AC
Q606, 609, 610	VSDTA144ES/-1	DTA144ES	AB
Q613	VS2SA933SQR1E	2SA933SQR	AB

REF. NO.	PART NO.	DESCRIPTION	CODE
INTEGRATED CIRCUITS			
IC601, 602	VHi BA7765AS-1		AL
IC603	VHi UPD4066B-1		AL
DIODES			
D601 | 605, 607, 608	RH-DX0048GEZZ or RH-DX0053GEZZ or VHD1SS119//-1	1SS119	AA AA AB
D606	RH-EX0020GEZZ	RD5.1EB1	AE
CONTROLS			
R609, 639	RVR-B5447CEZZ	20k(B), L-CH Playback Level 20k(B), R-CH Playback Level	AB
R666, 667	RVR-B5451CEZZ	200k(B), R-CH Bias Adj. 200k(B), L-CH Bias Adj.	AB
COILS AND TRANSFORMER			
L601, 602	VP-YF332J0000	3.3mH	AC
L603	VP-YF102J0000	1mH	AC
FL601, 603	RCiLF0076GEZZ	Filter	AF
FL602, 604	RCiLi0052GEZZ	Filter	AE
T601	RTRNH0046GEZZ		AE
CAPACITORS			
C601, 615, 631, 645	RC-QZA332TAYJ	0.0033μF, Mylar	AB
C605, 635	RC-QZA123TAYJ	0.012μF, Mylar	AB
C607, 637	VCEAEA1AW107M	100μF, 10V, 20%, Electrolytic	AB
C609, 639	RC-QZA223TAYJ	0.022μF, Mylar	AB
C612, 642	RC-QZA273TAYJ	0.027μF, Mylar	AB
C613, 643	RC-QZA103TAYJ	0.01μF, Mylar	AB
C664	VCQPKA2AA153J	0.015μF, 100V, 5%, Polypro Film	AB
C671, 674	VCE9EA1CW106M	10μF, 16V, 20%, Electrolytic (N.P.)	AC
MISCELLANEOUS			
	QPLGN0229TAZZ	Plug, 2 pin (TP601—602, TP603—604)	AB
	QPLGN0428TAZZ	Plug, 4 pin (BB)	AB
	QPLGN0628TAZZ	Plug, 6 pin (BA)	AB
	QSōCN0679GEZZ	Socket, 6 pin (K602)	AC
	QSōCN0879GEZZ	Socket, 8 pin (K601)	AC
	QSōCN1079GEZZ	Socket, 10 pin (K603)	AC
POWER CIRCUIT			
	RDENT0345GEZZ	Power Board Assembly	—
TRANSISTORS			
⚠Q904, 905	95KUAD0031SZ	2SD560	AF
⚠Q906, ⚠ 908	95KUAC0004AZ	2SC945	AC
INTEGRATED CIRCUIT			
⚠IC901	95KUCB0027AZ	UPC7805H	AG
⚠IC902	95KUCC0013DZ	UPC78N12H	AM
DIODES			
⚠D902, ⚠ 903, ⚠ 904, ⚠ 905, ⚠ 908, ⚠ 909, ⚠ 912, ⚠ 913	95KUBC0215BZ or 95KUBC0112AZ	RL1N4002 11E1	AB AB
⚠D910, ⚠ 911	95KUBC0216CZ or 95KUBC0150BZ	1A3 11ES2	AB AB
⚠ZD902, ⚠ 903	95KUBDAS5R6B or 95KUBDAC5R6B	UZ5.6BSA RD5.6ESAB1	AB AB
TRANSFORMER			
⚠T901	95K116035050	PT2548	BF
CAPACITORS			
⚠C901	95KUGCQ103AB or 95KUGZ0529ZZ	0.01μF, Ceramic	AD AD
C903	95KUGZ0654ZZ	2200μF, 35V, Electrolytic	AG
C908	95KUGAD222BU	2200μF, 25V, Electrolytic	AG
C915	95KUGAE102BU	1000μF, 35V, Electrolytic	AF
RESISTORS			
⚠R901	95KUECC275AB	2.7M ohm, 1/2W, Solid	AA
⚠R902, ⚠ 923	95KUEBBR20AG	0.2 ohm, 1/4W, Fusible Resistor	AC

REF. NO.	PART NO.	DESCRIPTION	CODE
MISCELLANEOUS			
⚠	95KEHS0381ZZ	AC Cord, AC 120V/60Hz	AL
⚠F901	95KPJC0175ZZ	Fuse, 1.6A, 125V	AD
	95KPZZ0265ZZ	Fuse Holder	AA
	95KECB7325ZZ	Plug, 12 pin (PA)	AH
INFRARED REMOTE CONTROL CIRCUIT			
	RRMCG0462GESA	Infrared Remote Control Unit	BA
TRANSISTOR			
Q3001	VS2SC2120Y/-A	2SC2120Y	AC
INTEGRATED CIRCUIT			
IC3001	RH-iX0920PAZZ	UPD6124G	AK
DIODES AND CRYSTAL			
D3001	RH-PX0142PAZZ	SLR-938C	AC
	VHD1SS270//-F		AA
CF3001	RFiLF0055PAZZ	470kHz	AD
MISCELLANEOUS			
	QTANZ0181PAZZ	Battery Terminal (+)	AA
	QTANZ0185PAZZ	Battery Terminal (−)	AB
	QTANZ0096PAZZ	Battery Terminal (+, −)	AB
CABINET PARTS			
	GCABA0181AASA	Upper Cabinet	AE
	GCABB0190AASA	Bottom Cabinet	AF
	GCōVH0057PASA	Battery Cover	AD
	RFiLW0114PASA	Filter	AC
	MSPRP0578PASA	Rubber Key	AM
	HPNLH0676PASA	Indication Plate	AH
	XYBSF20P08000	Screw	AA
MECHANISM CHASSIS PARTS			
1	PGiDS0023GEFW	Retaining Guide	AR
2	MSPRC0142GEFJ	Retaining Guide Spring	AA
8	MSPRC0144GEFJ	Azimuth Spring	AA
9	RHEDW0015GEZZ	Audio/Control Head Ass'y	AY
10	PCAPS1015GEZZ	Retaining Guide Cap	AA
11	QPWBF3077GEZZ	Audio/Control Head PWB	AB
12	MLEVF0292GEZZ	Audio/Control Head Arm	AD
13	MSPRD0087GEFJ	Audio/Control Head Arm Spring	AA
14	LHLDZ1606GEZZ	Loading Block Holder Ass'y	AC
15	QPRBF2886GEZZ	Loading Block PWB	AD
16	RMōTM1049GEZZ	Loading Motor	AM
17	QPLGN0529TAZZ	Plug, 5 Pin (MG)	AB
18	QSW-R0023GEZZ	Cam Switch	AF
19	NGERW1032GEZZ	Worm Wheel	AC
20	NPLYV0133GEZZ	Loading Motor Pulley	AC
21	NBLTK0058GE00	Loading Belt	AA
22	NGERW1031GEZZ	Worm Ass'y	AC
23	NSFTG0045GEFJ	Worm Shaft	AB
24	NGERH1118GEZZ	Master Cam	AC
25	MLEVF0281GEZZ	Pinch Roller Lever Ass'y	AN
26	MLEVF0290GEZZ	Relay Shifter Lever	AE
27	MLEVC0023GEZZ	Reverse Guide	AG
28	MSPRD0086GEFJ	Reverse Guide Spring	AA
29	RMōTN2019GEZZ	Capstan D.D. Motor	AZ
30	MLEVP0136GEZZ	Slow Brake Lever	AA
31	MSPRT0276GEFJ	Slow Brake Spring	AA
32	MSPRC0151GEFJ	Reverse Guide Spring	AA
33	MLEVF0289GEZZ	Relay Gear Drive Lever	AE
34	MSLiF0043GEZZ	Brake Shifter	AK
35	NSFTZ0068GEFD	Brake Lock Shaft	AC
36	MSPRC0143GEFJ	Absorber Plate Spring	AB
37	MSPRT0274GEFJ	Picture Scan (Video Search) Spring	AB
38	MLEVP0130GEZZ	Picture Scan (Video Search) Brake Lever	AD
39	MLEVP0131GEZZ	Picture Scan (Video Search) Reciprocating Lever	AC
40	RPLU-0083GEZZ	Brake Solenoid Ass'y	AF
41	NDAiV1046GEZZ	Take-up Reel Disk Ass'y	AG
42	NGERH1122GEZZ	Idler Gear Ass'y	AN
43	NPLYV0134GEZZ	Reel Pulley	AC
44	MSPRD0085GEFJ	Shifter Spring	AB
45	PCōVP1018GEZZ	Shifter Spring Cover	AC
46	LHLDP1092GEZZ	Cassette LED Holder	AE
47	RH-PX0169GEZZ	Cassette LED	AD
48	QPWBF2887GEZZ	Reel Sensor PWB	AK
49	RH-PX0175GEZZ	Reel Sensor	AB
50	LCHSS0016GEZZ	Reel Block Chassis	AL
51	MLEVP0134GEZZ	Tension Adjusting Lever	AC
52	MLEVP0133GEZZ	Tension Release Lever	AC
53	MLEVP0132GEZZ	Back Tension Lever	AC
54	MSPRT0273GEFJ	Spring, Fast Forward	AB
55	NDAiV1047GEZZ	Supply Reel Disk Ass'y	AH
56	MSPRT0272GEFJ	Main Brake Spring	AC
57	MLEVP0135GEZZ	Intermediate Lever	AC
58	MLEVP0129GEZZ	Main Take-up Brake Lever	AE
59	MLEVP0128GEZZ	Main Supply Brake Lever	AE
60	NGERH1121GEZZ	Loading Relay Gear	AA
61	MSPRT0271GEFJ	Loading Reciprocating Spring	AA
62	NGERH1120GEZZ	Take-up Loading Gear	AA
63	MLEVF0286GEZZ	Take-up Loading Arm Ass'y	AC
64	NGERH1119GEZZ	Supply Loading Gear	AA
65	MLEVF0285GEZZ	Supply Loading Arm Ass'y	AC
66	LCHSM0092GEZZ	Main Chassis Ass'y	AR
67	LBNDK1002GEZZ	Tension Band Ass'y	AD
68	LHLDZ1607GEZZ	Tension Spring Hook Plate	AA
69	MSPRT0275GEFJ	Tension Spring	AA
70	MLEVF0291GEZZ	Tension Arm Ass'y	AF
72	MSLiF0042GEFW	Take-up Pole Base Slider	AB
73	LPōLM0033GEZZ	Take-up Pole Base Ass'y	AG
74	NRōLP0062GEZZ	Guide Roller Ass'y	AE
75	MSLiF0041GEFW	Supply Pole Base Slider	AB
76	LPōLM0032GEZZ	Supply Pole Base Ass'y	AG
77	PGiDM0066GEZZ	Take-up Loading Rail	AB

REF. NO.	PART NO.	DESCRIPTION	CODE
78	PGi DM0067GEZZ	Supply Loading Rail	AB
79	NSFTL0563GEFW	Supply Impedance Roller Innor	AC
80	PGi DH0031GEFW	Supply Impedance Roller Flange	AA
81	NRōLP0056GEZZ	Supply Impedance Roller	AD
82	RHEDT0026GEZZ	Full Erase Head Ass'y	AK
83	QPWBF2936GEZZ	Full Erase Head PWB	AA
84	LANGA0054GEZZ	Supply Reel Disk Catch Holder Ass'y	AD
85	NBLTK0059GE00	Reel Belt	AB
86	MLEVP0146GEZZ	Auxiliary Fast Forward Brake Lever	AE
87	MSPRT0282GEFJ	Auxiliary Fast Forward Brake Spring	AB
89	DDRMU0004HE10	Upper Drum Ass'y	BV
90	PGi DC0039GEFW	Drum Base	AL
91	DDRML0012HE00	Lower Drum Ass'y	BE
92	QBRSK0021GEZZ	Ground Brush Ass'y	AC
93	RMōTP1096GEZZ	Drum D.D. Motor Ass'y	AW
96	QCNW-4880GEZZ	Full Flat Cable (Drum D.D. Motor)	AN
97	QCNW-4881GEZZ	Full Flat Cable (Capstan D.D. Motor)	AN
98	LHLDW1109GEZZ	Full Flat Cable Holder	AB
99	RDTCH0018GEZZ	Dew Sensor	AG
100	QSōCN0634REZZ	Socket, 5 Pin (MF)	AC
101	VRS-TW2ED221J	220 ohm, 1/4W, 5%, Oxide Film	AA
102	VCKYTV1HB102K	.001μF, 50V, 10%, Disc	AA
103	VRS-TV1JD104J	100k ohm, 1/10W, 5%, Oxide Film	AA
104	PCAPS8001GEZZ	Release Pin Cap	AA
105	LANGA0051GEFW	Take-up Reel Disk Catch Holder	AB
106	PGi DH0036GEFW	Supply Impedance Roller Flange L	AA

CASSETTE HOUSING CONTROL PARTS

	CHLDX3045GE99	Cassette Housing Control Assembly (Excludes the Cassette Cover)	BA
301	HDECQ0578GESA	Cassette Cover	AG
302	PGi DM0069GE00	Down Guide	AC
303	QSW-F0034GEZZ	Cassette Erase Protection Switch	AC
304	LHLDX1008GE00	Cassette Housing Frame (Right)	AF
305	MARMP0038GEZZ	Cassette Cover Arm	AA
306	NGERW1036GEZZ	Phase Gear	AA
307	MSPRD0088GEFJ	Drive Gear Spring (Right)	AA
308	NGERW1034GEZZ	Drive Gear (Right)	AB
309	MSPRT0277GEFJ	Reciprocating Spring	AA
310	NGERW1033GEZZ	Worm Wheel Gear	AB
311	MLEVP0142GE00	Open Lever	AA
312	MSPRD0091GEFJ	Open Lever Spring	AA
313	MLEVP0141GEZZ	Switching Lever	AA
314	MSPRT0280GEFJ	Switching Lever Spring	AA
315	QSW-F0035GEZZ	Cassette Switch	AD
316	LANGF9355GEFW	Worm Bracket	AB
317	NBRGP0013GEZZ	Bearing	AA
318	NSFTD0016GEZZ	Worm Shaft Ass'y	AE
319	MLEVP0140GEZZ	Clutch Lock Lever	AA
320	MSPRT0279GEFJ	Clutch Loch Lever Spring	AA
321	MLEVP0139GEZZ	Clutch Release Lever	AA
322	MSPRD0092GEFJ	Clutch Release Lever Spring	AA
323	MLEVP0138GEZZ	Clutch Lever	AA
324	NPLYV0135GEZZ	Pulley	AA
325	NBLTK0060GE00	Cassette Loading Belt	AB
326	LANGF9354GEFW	Upper Plate	AD
327	LHLDX1011GE00	Slider Holder (Left)	AB
328	MSPRP0097GEFJ	Cassette Spring	AA
329	LANGF9357GEFW	Slider Lock (Left)	AA
330	MSPRT0281GEFJ	Slider Lock Spring	AA
331	MSLiF0044GEFW	Slider	AF
332	MLEVP0137GE00	Lock Release Lever	AA
333	MSPRD0093GEFJ	Lock Release Lever Spring	AA
334	MLEVP0143GE00	Slider Lock Cover	AA
335	LANGF9356GEFW	Slider Lock (Right)	AA
336	LHLDX1010GE00	Slider Holder (Right)	AB
337	NGERW1035GEZZ	Drive Gear (Left)	AB
338	MSPRD0089GEFJ	Drive Gear Spring (Left)	AA
339	LHLDX1009GE00	Cassette Housing Frame (Left)	AF
340	NSFTD0015GEFD	Main Shaft	AD
341	MSPRD0090GEFJ	Cassette Cover Spring	AA
342	QPWBF3005GEZZ	Start Sensor PWB	AC
343	QPWBF2894GEZZ	End Sensor PWB	AB
344	RH-PX0053GEZZ	Phototransistor	AF
345	VS2SA937-Q/-1	Transistor	AC
346	QSōCN0595GEZZ	Socket, 5 Pin	AB
347	VRD-RA2EE153J	15k ohm, 1/4W, 5%, Carbon	AA
348	VRD-RA2EE223J	22k ohm, 1/4W, 5%, Carbon	AA
349	VRD-RA2BE332J	3.3k ohm, 1/8W, 5%, Carbon	AA
350	VRD-RA2BE472J	4.7k ohm, 1/8W, 5%, Carbon	AA
351	VRD-RA2BE103J	10k ohm, 1/8W, 5%, Carbon	AA
352	VCTYPA1EX473M	.047μF, 25V, 20%, Ceramic	AA
401	LX-WZ1020GE00	Cut Washer (4.2W-6.0-0.5)	AA
402	LX-HZ3046GEFD	Screw (B Tight BTN3P+6S)	AA

SCREWS, NUTS, WASHERS

201	LX-NZ3039GEZZ	Adjusting Nut	AA
202	XWHSD26-05060	Washer W2.6S-6-0.5	AA
204	LX-BZ3095GEFD	AC Head Screw	AA
205	XBPSD26P06000	Azimuth Adjusting Screw	AA
206	LX-BZ3096GEFD	Tilt Adjusting Screw	AA
207	XNFSD40-31000	Adjusting Nut (A/C Head)	AB
208	XWHJZ31-05054	Washer W3.1-5.4-0.5	AA
209	LX-WZ1041GE00	Washer W2.6-6-0.5 (LM)	AA
210	XHPSD26P06WS0	Screw C2.6P+6S	AA
211	XRESJ30-06000	E Ring-3	AA
213	LX-NZ4043GEFW	Adjusting Nut (X-Position)	AB
215	LX-WZ1003GE00	Washer CW2.1-5-0.5	AA
216	XRESJ12-03000	E Ring-1.2	AA
217	XBPSD26P03000	Screw 2.6P+3S	AA
218	LX-WZ1006GE00	Washer CW2.5-5.4-0.5	AA
219	XRESJ25-04000	E Ring-2.5	AA
220	XWHJZ25-05050	Washer W2.6-5-0.5	AA

REF. NO.	PART NO.	DESCRIPTION	CODE
221	XWHJZ25-01050	Washer W2.6-5-0.13	AA
222	XWHJZ25-02050	Washer W2.6-5-0.25	AA
223	LX-HZ3043GEZZ	Screw W2.6P+6S	AA
224	LX-BZ3099GEZZ	Screw WSW2P+11S(W5)	AB
225	LX-XZ3030GEFD	Screw M2x4	AC
226	XHPSD26P08WS0	Screw C2.6P+8S	AA
227	XJBSD26P08WS0	B Tight Screw C2.6P+8S	AA
228	XHPSD30P08WS0	Screw C3P+8S	AA
229	LX-WZ1040GE00	Washer CW2.5-6-0.5	AA
230	XJBSD20P06000	B Tight Screw 2P+6S	AA
231	LX-BZ3039GEFN	Screw W3P+9S-NI	AA
232	LX-HZ3045GEFD	Screw S3P+8S-6W	AA
233	LX-BZ3064GEFN	Screw SW3P+6S-NI	AA
234	XBPSD26P12J00	Screw SW2.6P+12S	AA
235	XBPSD30P05J00	Screw SW3P+5S	AA
237	XHPSD30P08000	Screw S3P+8S	AA
238	LX-RZ3001AEZZ	E Ring-3	AA
239	LX-WZ1042GE00	Washer CW2.7-7-0.5	AA
241	LX-RZ3011GEFJ	C/S Washer	AA
242	XWHJZ25-04050	Washer W2.6P-5-0.4	AA

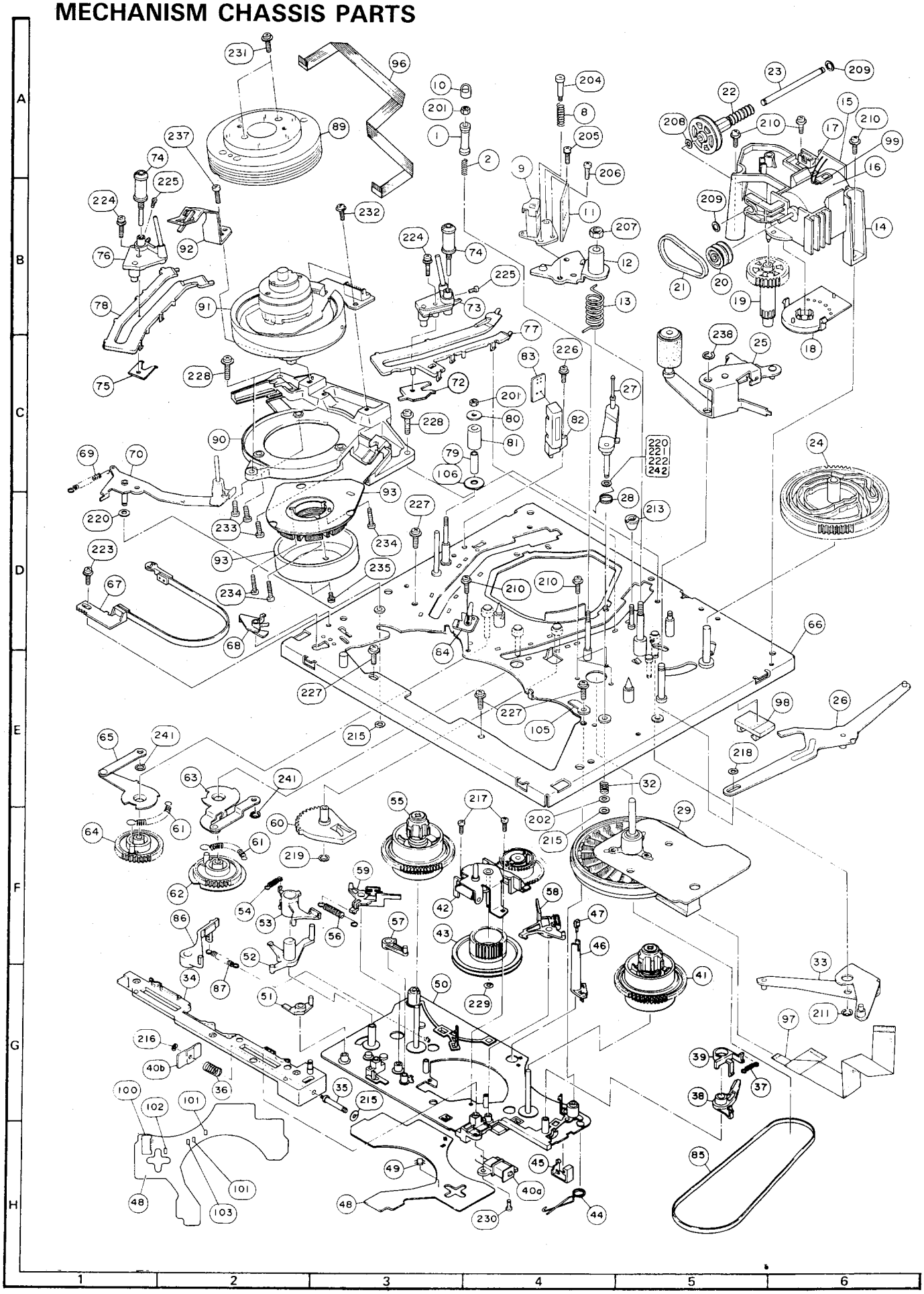
FRONT PANEL PARTS

REF. NO.	PART NO.	DESCRIPTION	CODE
500	CPNLC1563GEK1	Front Panel Ass'y	BB
501	JBTN-2230GESA	Button, Power	AD
502	GDōRF1569GESA	Door	AH
503	HBDGB1001GESB	Badge, "SHARP"	AD
504	HDECP0206GESB	Door Decoration Plate	AF
505	LANGF9360GES3	Door Support Metal	AE
506	TLABH0402GEZZ	Label, Inside the door	AC
507	GCōVA1425GEZZ	Remote Filter	AC
508	HDECQ0534GESA	Decoration Plate	AP
509	Hi NDP1516GESA	Indication Plate, Inside the door	AH
510	JBTN-2226GESA	Button, Eject	AB
511	JBTN-2227GESA	Button, REC	AA
512	LHLDZ3035GEZZ	Door Catch (x2)	AD
513	PCōVU9143GESB	Filter, Fluorescent Display Tube	AF
514	QEARP0272GEFW	Ground, Plate	AC

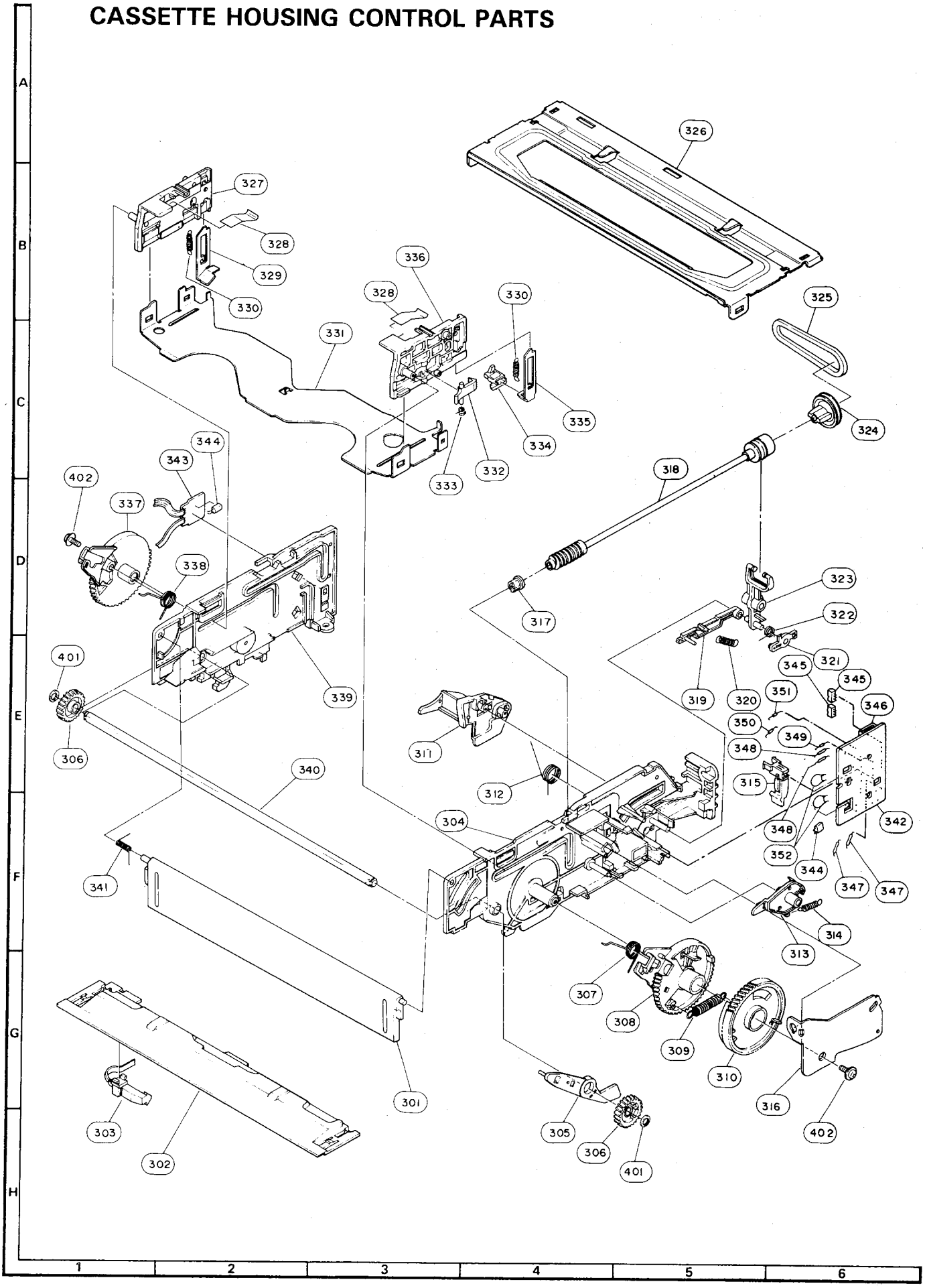
MECHANICAL PARTS

REF. NO.	PART NO.	DESCRIPTION	CODE
601	GCABB1077GEKZ	Main Frame	AU
602	CCABA3044GE02	Upper Cabinet	AR
602-1	GCABA3044GES3	Upper Cabinet	AR
602-2	TLABS0049GEZZ	Label	AB
603	GBDYU3052GEZZ	Buttom Panel	AG
604	GCōVA1504GEKZ	Terminal Plate	AF
606	LHLDZ1616GEZZ	Hi-Fi Holder	AA
607	LHLDZ1609GEZZ	Y/C Holer	AA
608	QEARP0276GEFW	Upper Cabinet Ground	AA
609	MSPRC0145GEFJ	Power Ground Spring	AA
610	XEBSD30P12000	Screw	AA
611	XHPSD30P06WS0	Screw	AA
612	XEBSD40P12000	Screw	AA
614	LX-HZ3040GEFF	Screw (for upper cabinet)	AA
615	LX-HZ3047GEFF	Screw (for bottom plate)	AA
616	JKNBP1049GESA	Slide Knob	AB
617	LHLDZ1614GEZZ	Holder, Fluorescent Display Tube	AC
619	LANGF9367GEFW	Cassette Holder Bracket	AB
620	TLABM1697GEZZ	Model Label	AB
621	LHLDP1095GEZZ	LED Holder	AD
622	PSPAZ0200GEZZ	Spacer	AA

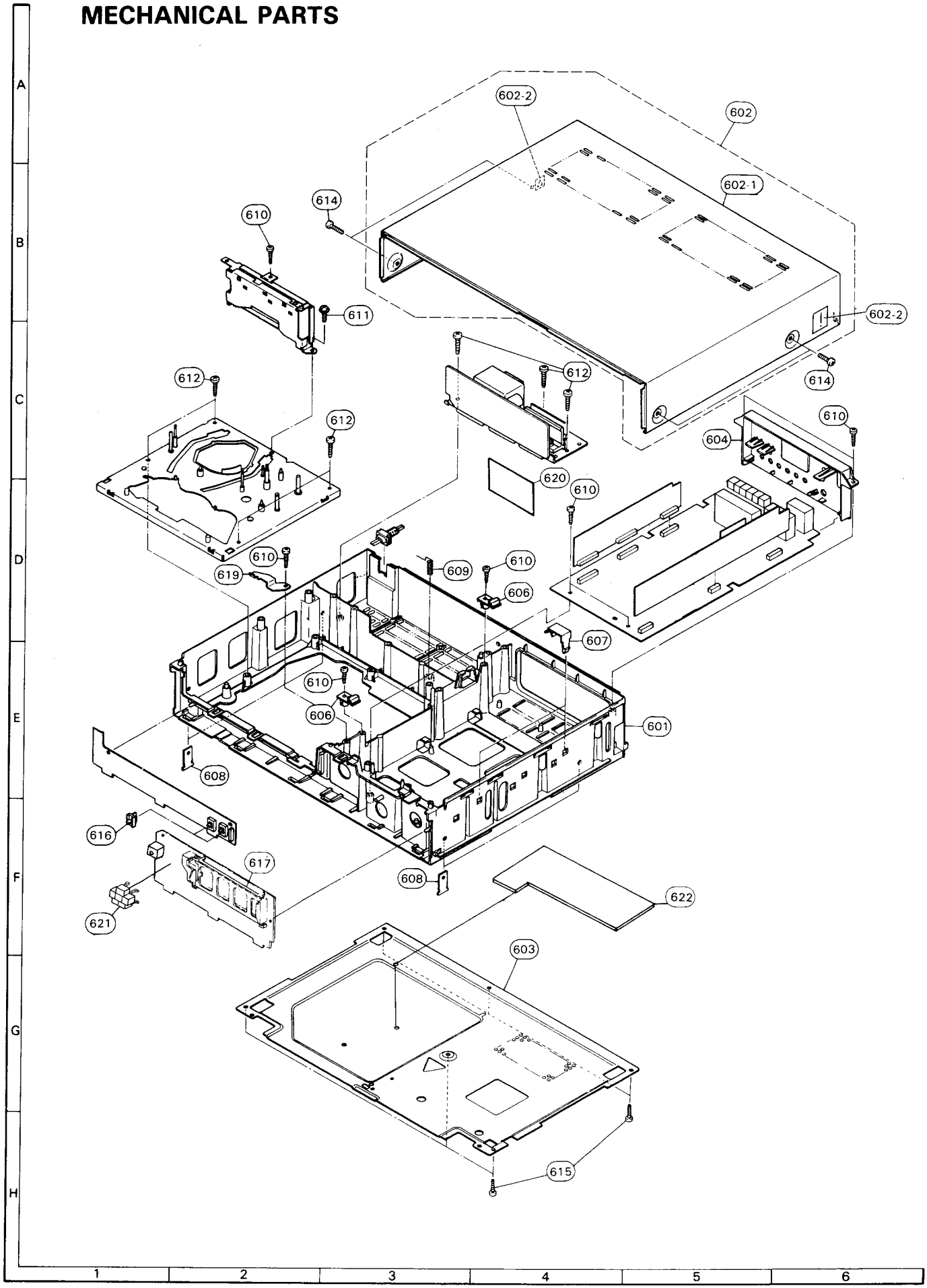
MECHANISM CHASSIS PARTS



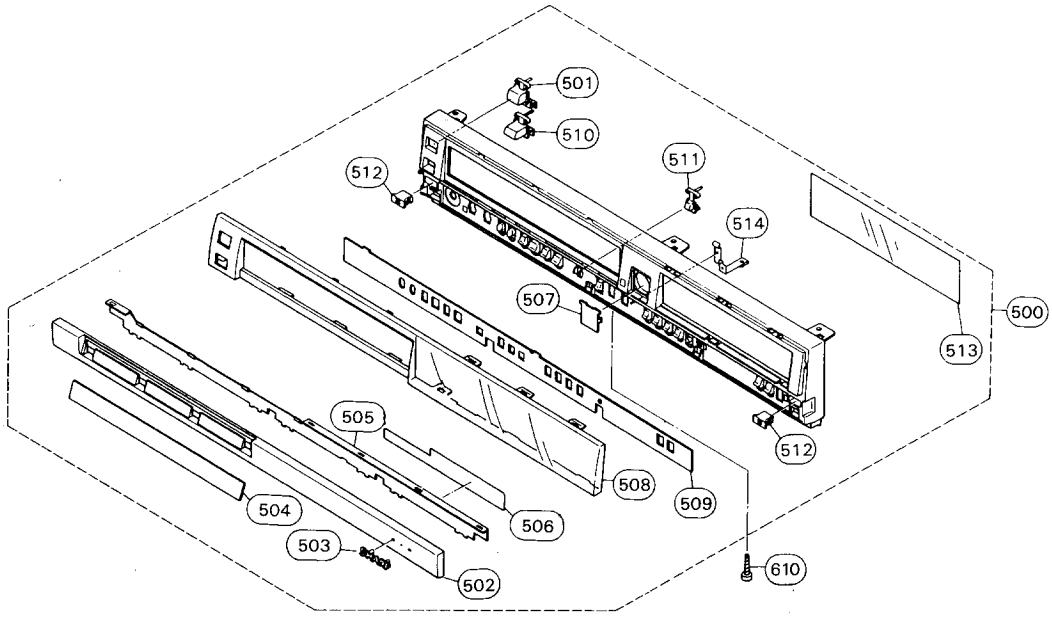
CASSETTE HOUSING CONTROL PARTS



MECHANICAL PARTS

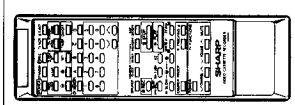
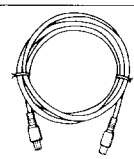
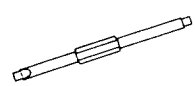


FRONT PARTS



ACCESSORIES

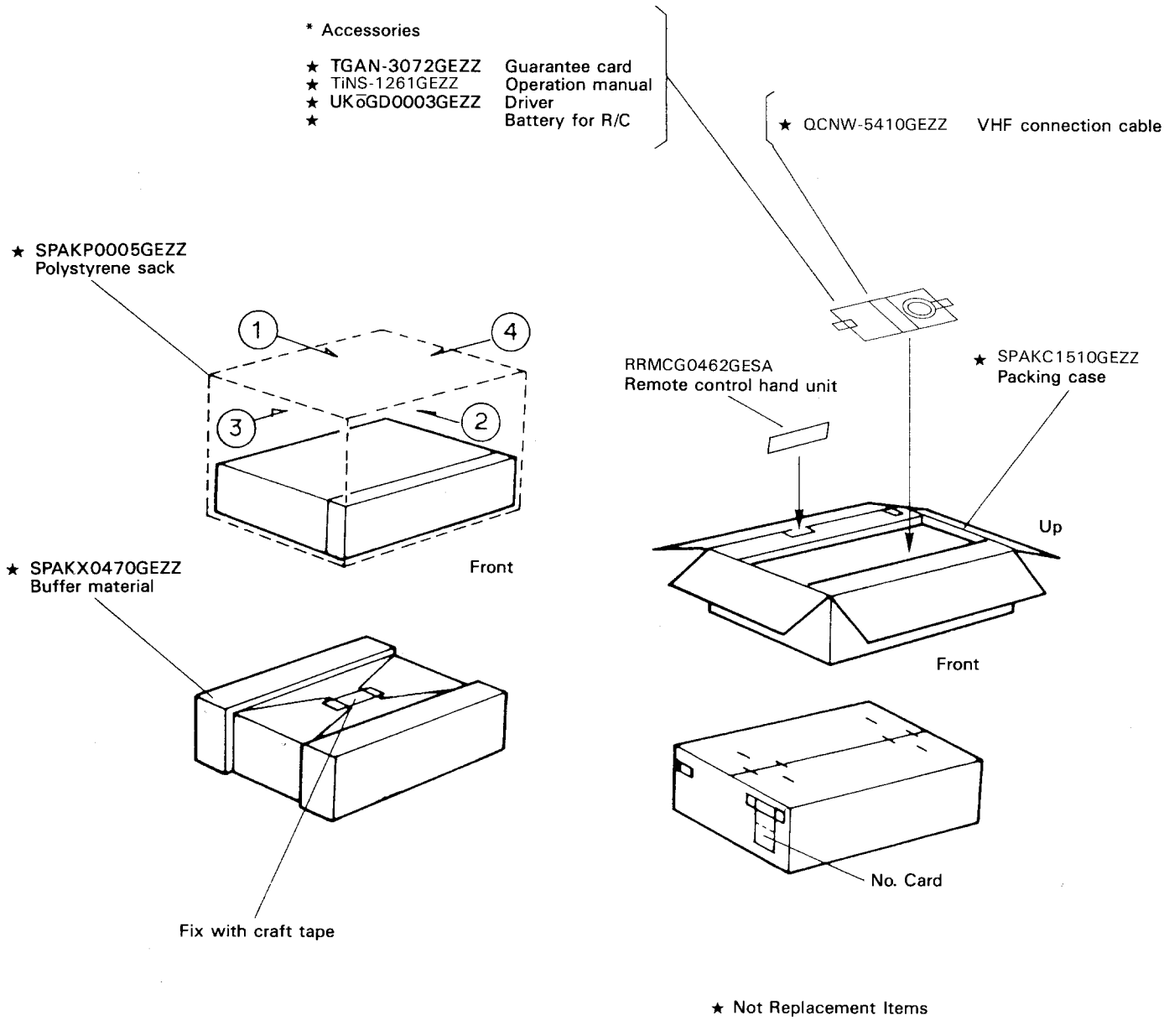
Be sure that the following accessories are all included with your VCR. If any are missing, contact your Sharp dealer.

Two AAA batteries SUM-4	 58-function remote control unit RRMCG0462GESA
 Round coaxial cable (75ohm, 3¼ feet) QCNW-5410GEZZ	 V-LOCK adjusting tool UKOGD0003GEZZ

PACKING OF THE SET

- **Setting positions of the Knobs**

Channel (RF)	3 ch	Blue screen	ON
EQUALIZER	Hi-Cut		



★ Not Replacement Items

T6658-S
Printed in Japan